MULTI-YEAR REVENUE AND EXPENDITURE FORECASTING FOR SMALL MUNICIPAL GOVERNMENTS

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Monterey, California

THESIS

MULTI-YEAR REVENUE AND EXPENDITURE FORECASTING
FOR
SMALL MUNICIPAL GOVERNMENTS

by

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and

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March 1981

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This thesis explores multi-year revenue and expenditure forecasting as a financial management tool available to small municipal governments. A generalized approach for developing a multi-year forecasting process is presented, together with a multi-year revenue and expenditure forecasting model for the City of Monterey, California. The Monterey model includes an econometric approach for projecting revenues, while the expenditure forecast is based on a deterministic approach. Suggestions for forecast presentation, an approach to model updating, and a discussion of the interrelationship between the budget formulation and forecasting processes is also presented.

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I. INTRODUCTION

A. DEFINITION

Revenue and expenditure forecasts are estimates of future cash inflows and outflows, utilizing various methods to adjust projections of current trends into the future. The essence of forecasting lies in the identification of all variables which will significantly impact future cash flows and the application of these variables to appropriate forecasting methods which will result in reliable revenue and expenditure projections. The key to effective forecasting is the degree of reliability which can be placed on the results attained. Once credibility of the forecasting process has been established, it can be used as an effective management tool [Ref. 1].

B. DESCRIPTION OF PROBLEM

A recently released study, conducted by the Joint Economic Committee and the Government Finance Research Center, provides an assessment of the fiscal condition of over 300 cities with populations greater than 10,000 [Ref. 2]. Some of the observations and findings of the report, which analyzes local government current revenues and expenditures, balance sheet, borrowing, employment pattern, and capital and selected functional expenditures for 1978 and 1979 as well as 1980 projections, are as follows:

1. For all cities, current expenditures are rising faster than current revenues. As a result, the percentage of cities with operating deficits increased between 1978-1979, and by 1980, a greater proportion of cities are anticipating deficits than are anticipating surpluses.

2. In the wake of Proposition 13 and similar measures, city property tax receipts declined in absolute terms and as a proportion of total city revenues in fiscal year 1979. The overall significance of property tax receipts in city budgets has greatly diminished in the past two years.

3. Federal funds used for city operating purposes declined both absolutely and as a proportion of current total revenues for all sizes of cities except the largest cities during the period under review.

4. Reductions in property tax and federal aid revenues are being offset partially by increases in local non-property taxes, as well as by new and increased user charges and state aid.

5. In contrast to general government activity, expenditures and revenues of self-supporting city enterprises have grown sharply over the period for cities of all sizes. However, growth in expenditures has outstripped revenue growth. Failure to reverse this trend could halt the capital spending plans of many city enterprises, especially in times of tight monetary conditions.

According to the Government Finance Research Center, one can expect a growing number of cities to experience severe fiscal stress in the coming decade. Most cities

enhanced their solvency in recent years as a result of three factors: natural economic recovery, increased direct federal assistance, and deferred capital expenditures. These factors however are changing. For most cities, the unexpectedly high rate of inflation will probably increase city expenditures more than revenues. Federal aid to cities has tapered off and is rapidly declining in real terms, a trend not likely to be reversed in the near future. The deterioration of the capital plant in many cities has reached a critical stage. Capital expenditures, therefore, may be deferred in the future, only at the risk of physical collapse [Ref. 3].

Faced with this bleak fiscal outlook it is surprising that few local governments take a systematic approach to projecting revenues and expenditures beyond one year as evidenced by recent surveys conducted by the Urban Consortium [Ref. 4], International City Management Association [Ref. 5], and the National League of Cities [Ref. 6]. These surveys have also suggested the need for more reliable forecasts of revenues and expenditures in the three to five year time frame.

C. THESIS OBJECTIVE

This thesis addresses current literature in the area of revenue and expenditure forecasting in the public sector with the express purpose of providing recommendations for improvement of Monterey, California's current forecasting process. The development of a revenue and expenditure forecasting model for general application by small municipal

governments in their budget formulation and overall fiscal planning processes is also addressed.

D. METHODOLOGY

Research effort for developing the review of forecasting theory was accomplished by literature search of journals, periodicals, books, proceedings from recent workshops and symposiums, and publications by leading organizations in the field of municipal financial management such as the League of California Cities, the National League of Cities, the Urban Consortium, and the United States Department of Housing and Urban Development. Also, in an effort to gain first-hand knowledge of current municipal government forecasting techniques, the authors attended the Financial Management Seminar sponsored by the League of California Cities in December 1980.

Review of forecasting models currently employed by various municipal governments, representing a cross-section of the nation both in terms of size and location, was accomplished to provide familiarization with workable approaches to model development.

A management audit approach was used to evaluate the forecasting process of Monterey, California in accordance with principles and practices of performance auditing adapted from the policies of the United States (U.S.) General Accounting Office (GAO). With this completed, the model presented in Chapter IV was tested and conclusions and recommendations rendered.

E. THESIS ORGANIZATION

Chapter II provides an overview of modern forecasting techniques including "expert judgement," trend analysis, deterministic techniques, and statistical or econometric modeling, an explanation of how such techniques can most effectively be employed, and the identification of significant shortcomings of each.

Chapter III presents an audit of the forecasting process currently used by the city of Monterey, California. Major elements of the audit are discussed including the preliminary survey of Monterey's organization and management activities to establish tentative audit objectives; review and testing of the city's management control systems to provide relevant, material, and competent evidence to establish a firm audit objective; a detailed examination to obtain sufficient evidence on the firm audit objective to support audit findings and conclusions; and finally, a management letter which communicates the results and recommendations to the City Manager of Monterey, California.

Based on the review of modern forecasting techniques and recommendations generated from the audit of Monterey's forecasting process, Chapters IV and V prescribe a systematic approach for developing a revenue and expenditure forecasting model. Chapters IV and V also address the flow of information needed to develop revenue and expenditure projections. Chapter VI discusses forecast presentation, the interrelationship between forecasting and budgeting, and updating the

forecasting model. Chapter VII provides a summary, conclusions, and recommendations for future work in this area.

II. OVERVIEW OF FORECASTING THEORY

The state of the art in revenue and expenditure forecasting is varied. While some state governments have sophisticated revenue-forecasting schemes that project for a five-year period [Ref. 7], literature reveals that few, if any, have a similar technique for expenditures. At the local level there are very few attempts to carry out any systematic revenue and expenditure forecasts. A recent survey by the Urban Consortium included 28 cities and six counties with populations of more than 500,000 and received an 82 percent response. While the survey was able to identify the existence of some systematic techniques, 72 percent of the respondents stated that the forecasts were primarily extrapolation, ". . . taking into account recent trends and adjusting these trends based on current information on future trends."[Ref. 8]

In reviewing current forecasting theory, this chapter will focus on the following areas: purposes and uses of fiscal forecasting; approaches to forecasting, including advantages and disadvantages of each method; revenue forecasting; expenditure forecasting; and practical application of the theory in various municipalities throughout the United States. The concern in this review is with forecasting for an intermediate period -- approximately five years, rather than the one-year forecast used to develop the annual budget.

A. PURPOSES AND USES OF FISCAL FORECASTING

The benefits most frequently cited by jurisdictions which have been preparing multi-year forecasts for some time are as follows:

- Financial forecasts act as an advance warning system that identifies future financial problems and provides decision-makers with sufficient time to plan and take necessary corrective actions.

- Financial forecasts can illustrate both the immediate and longer-term fiscal implications of various economic and policy scenarios, as well as the extent to which governments can afford them, thereby better enabling decision-makers to plan and budget for the future.

- The process of preparing financial forecasts increases the awareness of long-range implications among officials throughout government, with the result that decisions are more likely to reflect longer-range implications.

- Financial forecasts have made a major contribution in labor negotiations by illustrating exactly what the jurisdiction can and cannot afford.

- The existence of financial forecasts, regardless of whether they show future surpluses or deficits, has had a favorable and significant impact on the bond ratings of both Standard & Poors and Moody's because it indicates the presence of sound financial management practices.

- Financial forecasts have been instrumental in supporting arguments for new revenues or the transfer of service responsibility, and expenses, to other governmental organizations.

- Financial forecasts can help council members, the press, business and citizen organizations, and the general public understand the true, long-term costs of various projects, programs, and proposals [Ref. 9].

The first three benefits cited above illustrate the use of revenue and expenditure forecasts in an <u>impact analysis</u> mode where the intent is to estimate the budgetary effects of a policy or external changes [Ref. 10]. Here the

forecasting process and resultant forecasts improve the planning, budgeting, and decision-making capabilities of government managers by quantifying the future implications of current decisions. For example, the implications of collective bargaining agreements over the life of a labor contract can be modeled and integrated into an intermediate-term fiscal plan. An especially important kind of impact analysis is the estimation of the intermediate-term operation and maintenance costs of capital projects. If capital investment priorities are assigned on a cost/benefit basis, an estimate of the full cost stream is important but often overlooked information.

The last four benefits outlined above illustrate the use of revenue and expenditure forecasts in a gap analysis mode where the intent is to anticipate revenue-expenditure imbalance [Ref. 11]. Here, the emphasis is on the magnitude of revenue and expenditure adjustments needed to balance future budgets under a specific set of policy and economic assumptions. The real growth in the national economy, the role of inflation, and regional shifts in the distribution of national income and population are all important considerations in fiscal forecasting.

B. APPROACHES TO FORECASTING

Dr. Roy Bahl, Professor of Economics and Director, Metropolitan Studies Program, Maxwell School, Syracuse University, has identified four basic approaches to forecasting: expert judgment, trend analysis, deterministic

techniques, and statistical analysis [Ref. 12]. Each of the techniques is discussed below.

1. Expert Judgment

By their very nature there is very little that can be said about "expert" forecasts since there is no single methodology that is used in such an approach. The key ingredient to successful expert forecasting is, of course, the expert who must know the system, the local economy, and also know how to obtain additional information [Ref. 13].

The major limitations of this approach are the inability to demonstrate how a particular value was obtained, and its dependence upon the state of mind and continued presence of one individual -- the "expert." The technique is also likely to prove to be weak when revenues or expenditures extending for time periods of greater than a single year are being forecast because of the greater number of variables which must be considered in making judgments about the future.

2. Trend Analysis

For certain revenues and expenditures, time itself becomes a crucial determining variable. In such cases, fairly accurate predictions may be obtained by assuming that the revenue or expenditure stream is a function of time, analyzing recent historical trends, and projecting these trends into the future. Indeed, for some revenue and expenditure streams the assumption that time is the sole important determinant may not be unreasonable. San Diego,

after Proposition 13, has taken this approach in estimating property taxes.

The major weakness of trend analysis is its inabilit- to predict the effect of changing economic conditions on overall historical trends [Ref. 14]. It will never predict a "turning point" but, rather, continue to project increases (decreases) throughout the projection period regardless of economic conditions. For this reason, the approach is virtually useless for any type of policy analysis, e.g., what is likely to happen if major economic or demographic changes occur within the city.

3. Deterministic Techniques

Deterministic approaches generally allow for variables other than time in deriving projections. For example, such a technique would observe that over recent years, on average, $15.75 has been collected per resident in the form of fines and forfeitures. If the population is expected to increase by 1,000 during the next year, an additional $15,750 collected from fines and forfeitures would be forecasted. Another example on the expenditure side of the budget would be the projection of additional teacher salaries based upon mandated student/teacher ratios and the anticipated increase in public school enrollment.

A variation of the deterministic approach to revenue forecasting sometimes used in intermediate-term forecasting is what is known as an elasticity-based forecast. Many economic series depend primarily on the level of income in an area, with the relationship between income and the tax

yield known as income elasticity. Expressed mathematically:

$$\text{Income Elasticity in Tax Yield} = \frac{\text{Percentage Change in Tax Yield}}{\text{Percentage Change in Personal Income}} \quad \text{(Equation 1)}$$

$$\text{Percentage Change in Tax Yield} = (\text{Income Elasticity}) \times \text{Percent Change in Personal Income} \quad \text{(Equation 2)}$$

In Equation 1, the change for the numerator and the denominator must be calculated for the same time period. Given the income elasticity of a tax and the percent by which income is likely to grow during the projection period, Equation 2 can then be used to compute the percentage growth in the tax revenue source. While the approach is quite simple, the implication is that such deterministic techniques will require statistical analysis to determine the elasticities.

As noted by Bahl, the deterministic approach to intermediate-term revenue forecasts leaves much to be desired, especially for revenues associated with the level of economic activity. While on the expenditure side it is "flawed in assuming fixed relationships between inputs and activities." [Ref. 15] The existence of either service capacity slack or shortage is not considered.

Deterministic projections have been used and are most closely associated with "fiscal impact analysis." [Ref. 16] This approach may be useful when considering longer term projections, especially the impacts of proposed developments or annexation decisions.

4. Statistical Analysis

The most common approach in statistical forecasting is to forecast series independently rather than simultaneously. The procedure requires a number of steps. First, a revenue (expenditure) series is hypothesized to depend upon one or more "independent" or causal variables. Second, data are collected for as many past years as is possible. At this point, internal records of the city must be reviewed to determine the availability of historical data on particular revenue (expenditure) series. Third, a statistical relationship between the revenue (expenditure) stream and the independent variable(s) is determined. Linear regression techniques are commonly used for this estimation. For example, one might specify that sales tax revenues are a linear function of personal income and the sales tax rate and thus obtain the following regression equation:

Sales Tax = 16.221 + (.013) Personal Income + (7.248) Tax Rate

This equation suggests that for each additional dollar of personal income an additional 1.3¢ in sales tax revenues is generated even if rates remain constant [Ref. 17]. Fourth, after the final equation is chosen, the forecaster must obtain projected values for each of the independent variables during the projection period.

According to Bahl, "The principle advantage of statistical over deterministic methods is the theoretical basis for establishing the relationships. This means that

statistical inference can be used in testing the hypothesized relationship among variables." [Ref. 18] In addition, a purely deterministic approach is likely to include but a single "causal" variable, e.g., population, while the statistical regression approach allows for several independent variables to be used simultaneously. This provides greater opportunities in using the method for policy analysis since it is possible to estimate the effect on revenues (expenditures) of a particular change in one independent variable while holding the others constant.

The statistical approach is likely to be more costly than the more simplistic models discussed above. Personnel trained in economics and statistics, additional data collection, and computer facilities will be necessary. Errors in prediction may still occur since each of the four steps outlined above contain potential problems. The regression equation may be poorly specified; the data used may be inappropriate; and, most importantly, the forecasts of the independent variables during the forecast period may themselves be in error. In addition, many variables that are hypothesized as being "independent" may actually be "interdependent," thus creating statistical problems that lead to poor projections.

C. REVENUE FORECASTING

While there is wide variation in the approaches used by municipalities in projecting revenues, the problems faced and the steps taken in developing a forecast are similar.

The four most important problem areas, identified by Bahl and discussed separately below, include: cleaning the tax revenue series of discretionary changes in the rate and base, developing an appropriate model for the purposes of estimation, and forecasting intergovernmental revenues [Ref. 19].

1. Cleaning the Tax Series

Tax bases vary over time as the result of statutory changes, such as a different legal assessment ratio for the property tax or the inclusion of additional services in the retail sales tax base. Revenue projections should show how much the current tax structure will yield over some future period if no discretionary changes take place, i.e., the automatic growth which the tax structure will generate. Since historical data will be used to make such a projection, it is important that these data be cleaned of all past discretionary changes in rate and base.

In projecting revenue sources, the National League of Cities recommends the use of a "standard tax base" [Ref. 20]. A standard tax base is one for which the historical data have been adjusted to one statutory definition, usually the current one. Similarly, tax rates may also have changed. Projections that fail to account for past changes in revenue yields resulting from statutory tax base or tax rate changes will reflect these statutory changes in future revenues, as well as in economic trends. Standardizing past yields will produce projections that predict on the basis of

economic trends instead of uncertain future statutory amendments.

2. Choosing the Independent Variable

The revenue yielded by a standard tax base and constant tax rates ultimately depends on the growth in local economic activity. The most common measure of local economic activity to which revenues from various taxes are tied is the total personal income of the community. Increases in a local personal income tax base directly depend on increases in personal income.

Despite this common practice, there are serious problems associated with the use of personal income as the independent variable. Bahl argues that available measures of personal income are subject to major omissions, that data on personal income are generally two years out of date, and that personal income figures are not available on a small area basis, i.e., city or county [Ref. 21]. For these reasons, the aggregate level of private employment has been suggested as a better indicator of local economic activity [Ref. 22].

3. Defining the Model

A third major problem in developing revenue forecasting techniques is the defining of an appropriate model. The traditional model estimates tax revenue growth as a function of growth in some indicator of local or state economic activity. This approach does not allow for a feedback effect, e.g., for the effects of taxes on the

level of personal income. It may, however, express taxes as a function of a number of independent variables, usually in a single-equation model. Cities have used a variety of different variables to forecast taxes, but most specifications include population, personal income, and some measure of prices.

The alternative is to specify a simultaneous-equation model which does allow for the feedback effects. Simultaneous-equation models have several advantages as a forecasting methodology. The flexibility provided by a multiple-equation system can allow for greater realism in modeling revenue functions, and such models are easily adaptable for simulation by changing the exogenous variables within the several equations over a range of values [Ref. 23]. However, the advantages of simultaneous models do not come without additional costs. Data requirements are in most instances massive and a substantial investment must be made to build, estimate, and update the model. As a result, forecasting literature contains few examples of the use of this technique at the local government level.

4. Projecting Intergovernmental Flows

The fourth problem with revenue forecasting is developing a proper treatment of intergovernmental flows. Intergovernmental revenues have grown in importance during the past decade. Accurate predictions of total local revenues will be unlikely unless this important source can somehow be projected. Unfortunately, for many such revenues

the basic determining variable is the decision of a higher level of government which may be extremely difficult to predict. Nevertheless, several alternative, non-statistical methods are possible.

Possibly the easiest method is simply to make an assumption about the different forms of intergovernmental aid. The most conservative set of assumptions would be to assume that any aid program that is scheduled to expire during the projection period will, in fact, not be renewed. A less conservative assumption is that the aid will continue at its current level throughout the projection period.

A variation on the purely assumption-based technique is to use further "expert" opinion regarding particular types of intergovernmental aid programs. This could take the form of consultation with local legislators in the higher governmental units to obtain their assessments regarding program aid continuation.

Bahl makes the point that while direct federal or mandated federal pass-through funds could be projected from formulae and estimated appropriation size, state aid flows are more difficult to estimate since they vary with the fiscal position of the state government. "In states where such transfers are important, one is led to the inescapable conclusion that a local government revenue forecast requires a state government revenue forecast." [Ref. 24]

D. EXPENDITURE FORECASTING

The expenditure forecasting problem is considerably different from the revenue forecasting problem. On the tax revenue side, the issue is one of projecting the growth in the tax bases to determine how much revenue will be generated at a given rate structure. On the expenditure side, the forecast requires assumptions about desired service levels, worker productivity, labor and material costs, the level of employment, capital improvements, and the level of fringe benefits. Since the local government has more room for discretion in these areas, the expenditure forecasting problem is more difficult than the revenue forecasting problem [Ref. 25].

The most common approach, termed "incrementalism" used in forecasting municipal expenditures is to adjust current expenses for inflation as well as anticipated growth in real inputs caused by population growth and completion of capital facilities.

The initial step in such a projection is standard: clear identification of current levels of service and definition of the baseline expenditure increase. This is commonly referred to as a "constant service level budget" and may entail either no real growth in expenditures, or only sufficient growth to keep pace with an expanding service base [Ref. 26]. Several additional adjustments are also often made in deriving the baseline expenditure projections. These are related to policy decisions already made within the jurisdiction (e.g., service level changes) or mandated by

higher levels of government. Finally, the effects of additions to (deletions from) the capital plant on operating and maintenance expenses are also frequently taken into account.

Once a baseline definition is agreed upon, increases or "increments" in the baseline expenditures must be estimated. For greater accuracy, this information is usually obtained from individual departments. To avoid "wish lists," the centralized forecasting unit usually reviews departmental projections closely and requires justification of proposed changes. Finally, these baseline figures are inflated by expected inflation rates (for non-personnel costs) and changes in wage rates.

Current forecasting literature provides little in the way of a systematic, analytic approach to expenditure forecasting. Bahl provides a possible expanation:

> Statistical estimation and trend fitting can play a role in the overall approach; however, it is unlikely that a city will find the benefits of projections from a full scale economic model to be worth the costs associated with building and estimating such a model [Ref. 27].

However, there are related analysis of expenditure determinants which can provide a starting point for simulating alternative expenditure outcomes [Ref. 28].

Regardless of the approach taken, one of the major problems in forecasting municipal expenditures is how to treat inflation. While there is some disagreement concerning the quality of indices of prices paid by local governments for labor and nonlabor services, one general guideline

suggested by the National League of Cities is the U.S. Department of Commerce Implicit Price Deflator for State and Local Government Goods and Services. This index is published annually in the July issue of the Survey of Current Business.

E. PRACTICAL APPLICATIONS OF FORECASTING THEORY

To illustrate the practical applications of existing forecasting theory, the discussion will now focus on multi-year revenue and expenditure forecasting models currently being used in the following municipalities: San Diego, CA; Dallas, TX; Washington, D.C.; Portland, OR; and Ventura, CA. These cities were chosen not only for their contrasting fiscal forecasting methodologies, but also to provide a cross-section in terms of geographical location and population size.

1. San Diego, CA [Ref. 29]

The City of San Diego prepares an annual "Six-Year Revenue and Expenditure Forecast" which encompasses all revenue and expenditure items in the City's operating budget. This forecast is prepared during the budget season and presented with the Proposed Operating Budget by the City's Financial Management Department. The forecast describes the fiscal impact of providing a constant level of service over the next six years assuming no new revenue sources and no property tax increases.

The Financial Management Department uses several techniques to forecast the City's operating revenues. The majority of the City's revenues are forecast econometrically. Expert judgment is used to forecast intergovernmental revenues, land

sales, special assessments, interest income, income from private sources, and most other revenues.

Growth in City expenditures is currently limited by local initiative to 3/4 of the inflation rate, with allowances for increased population growth. In the past, the City used two different incremental approaches to forecast expenditures. In the most recent approach, the Financial Management Department started with the current cost of providing the current level of services, as noted in the Proposed Budget. These costs were then adjusted to account for population growth over the forecast period, with the costs assumed to increase in direct proportion to population. Where strong reasons existed for the lack of a population/expenditure relationship, then expert judgment was used to adjust the initial figure for increased demand. Labor costs were adjusted for wage and salary growth, and non-labor costs were adjusted for inflation. Neither the effect of new capital facilities nor cost mandates were explicitly incorporated into the expenditure forecast.

In the distant past, expenditure forecasts were largely developed by individual departments, based on guidelines provided by the Financial Management Department. These guidelines specified the inflation rates, salary growth rates, and population growth rates to be used in each year of the forecast. Departmental expenditure forecasts were reviewed by the Financial Management Department and compared against its own expenditure projections for the purpose of identifying and resolving sizeable discrepancies.

The change from a decentralized to a centralized approach was made for two main reasons. First the departments resented the additional work at the same time that the budget was being prepared. Second, Proposition 13 reduced the need for more detailed expenditure forecasts.

2. Dallas, TX [Ref. 30]

The City of Dallas prepares an annual "Long Range Financial Plan" covering General Fund and General Fund supported activities over a five-year period. This forecast is prepared by the Office of Management Services with departmental input provided by the Office's budget analysts. The forecast is prepared during the annual budget process and is wholly consistent with that budget.

The City uses both econometric and deterministic techniques to forecast revenues. Revenues generated for the past 15 years were carefully restated to fit the revenue categories used in the current accounting system. Each revenue category was then modeled econometrically. Revenues which could not be modeled successfully in this manner were modeled deterministically. Categorical grants and other revenues not used for recurring operational expenses are not included in Dallas' forecast.

The City uses an expanded incremental approach to forecast expenditures. First, departmental expenditures are disaggregated as follows:

- Personal Services
- Other Than Personal Services (OTPS)

-- Services

-- Supplies

-- Equipment

-- Reimbursements

Second, these basic costs are adjusted to account for approved or uncontrollable changes in service level, program mix, and service base; productivity gains; and the additional operating and maintenance costs of new capital facilities. Third, these costs are annualized -- adjusted to incorporate the full year's effect of mid-year changes. Finally, the costs are all increased using appropriate wage and salary growth factors (for Personal Services) and inflation factors (for OTPS).

3. Washington, D.C. [Ref. 31]

The City of Washington, D.C., prepares an annual "Multi-Year Financial Plan" covering all locally derived revenues, the City's Federal Payment, general revenue sharing funds, and all associated expenditures over a five-year period. The Financial Plan does not, at this time, include revenues and expenditures from non-appropriated sources -- primarily categorical grants and reimbursements. The forecast is prepared by the City's Office of Budget as required by the D.C. Home Rule Charter.

The City currently uses a variety of techniques to forecast revenues. The annual Federal Payment, a revenue source unique to Washington and one amounting to 24% of the City's revenues, and General Revenue Sharing are forecast

using expert judgment. Sales and use taxes are forecast using a combination of trend analysis and expert judgment. Income taxes are first disaggregated into revenues from withholding taxes, declarations, and payments with returns. Each is then forecast separately using a combination of trend analysis and econometrics with per capita income and property income being the independent variables. Property taxes, the fourth major revenue source, are now forecast deterministically by inflating the tax base by changes in the Consumer Price Index and adding the value of new construction, with the latter value based on expert judgment. Permits, licenses, fees, fines, forfeitures, miscellaneous taxes, and other minor revenues are forecast using trend analysis.

The City uses both incremental and deterministic approaches, and a sophisticated accounting system, to forecast expenditures for over 500 different responsibility centers or program units. Within each responsibility center, expenditures are divided into Personal Services and Other Operating Costs, as follows:

Personal Services

- Wages and Salaries -- by pay plan
- Benefits
  - -- Current Employees (e.g., life insurance, health benefits, retirement contributions, FICA, etc.)
  - -- Retirees (e.g., pensions, survivor benefits)

Other Operating Costs

- Other Than Personal Services (OTPS)
- Debt Service
- Uncontrollable Program Costs (e.g., public assistance, unemployment compensation, transit subsidies)

The expenditure side of this Multi-Year Plan is computerized and can display cost projections along agency/organizational lines or according to program objectives. Computerization also enables the Office of Budget and Resource Development to alter wage and salary inflators and other inflation factors, and quickly recalculate expenditures -- including new facility operating costs and uncontrollable costs.

4. Portland, OR [Ref. 32]

The City of Portland prepares an annual "Five Year Projection" of all General Fund revenues and expenditures. This forecast is prepared by the Office of Management Services, Bureau of Management Services, Bureau of Management and Budget. Information on the City's operating bureaus is obtained mainly from budget analysts in the Bureau of Management and Budget. The forecast is completed two to three months after the budget is adopted.

The City uses a combination of expert judgment and trend analysis to forecast revenues. Actual revenues since 1963-64 are tabulated and used to guide each revenue projection. Collection rates are estimated for both current and delinquent property taxes and uses to calculate the

corresponding tax revenues. Expert judgment is used to forecast most intergovernmental transfers, intra and interfund transfers, contractual revenues, the beginning balance, and other revenues where changed circumstances have made trend analysis inapplicable. Simple time series regression equations are used to forecast revenues from non-property taxes, construction permits, public works and public utility charges, and misclaneous service charges and fees.

The City uses an incremental approach to forecast expenditures. Unlike most other cities, however, expenditures are not broken out by department. Instead, expenditures are broken out into Departmental and Non-Departmental Expenditures as follows:

Departmental Expenditures

- Personal Services
  - -- Full-Time Employee Wages
  - -- Benefits
  - -- Other Personal Services (part-time, overtime, premium pay)
- Materials and Services
  - -- Services - External (services bought from non-City sources)
  - -- Operating Supplies - External (supplies bought from non-City sources)
  - -- Other Material and Services (e.g., education, travel, insurance)
  - -- Interfund Transfers (centralized fleet; electronic, printing, and distribution services)

Non-Departmental Expenditures

- Other Obligations

-- Special Appropriations (City obligations separate from the normal operations of any particular agency)

-- One-Time Projects

-- Fund Transfers (subsidies to other funds)

-- Stock Increases

-- City Match to Grants

- Contingencies
- Future Local Costs of Existing Projects
- Contractual Programs
- Intergovernmental Grant Programs

Forecasts for Departmental Expenditures are developed by adjusting the base year costs for any mid-year salary adjustments (annualizing them); deducting non-continuing costs (e.g., grant programs, grant matches, contractual programs, and one-time projects); and applying an appropriate wage or inflation factor. Separate wage or inflation factors for each cost category under "Personal Services" and "Materials and Services" are based on the Consumer and Wholesale Price Indexes and on variants of the City's General Fund inflation rate. Non-Departmental Expenditures are forecast using expert judgment.

5. Ventura, CA [Ref. 33]

The City of Ventura prepares an annual five-year financial forecast which encompasses revenues and expenditures for General Fund departmental operations and capital improvements. The forecast is prepared by the City's Budget Officer for the purpose of providing the City Council

with advance information regarding the City's anticipated financial condition based on identified assumptions.

City revenues and expenditures are projected utilizing historical trends and anticipated economic conditions over the forecasting period. Expert judgment is used to predict annual inflation rates and annual population increases. Previous year service levels are utilized as the basis for cost projections over the next five years. No additional revenue sources are utilized and current fees and service charges are held constant.

Figure II-1 provides a recap of the five multi-year revenue and expenditure forecasting models discussed above.

COMPARATIVE MULTI-YEAR FORECASTING APPROACHES

	REVENUE FORECAST APPROACH	EXPENDITURE FORECAST APPROACH
SAN DIEGO	ECONOMETRIC/ EXPERT JUDGMENT	INCREMENTAL
DALLAS	ECONOMETRIC/ DETERMINISTIC	INCREMENTAL
WASHINGTON, D.C.	ECONOMETRIC DETERMINISTIC TREND ANALYSIS EXPERT JUDGMENT	INCREMENTAL/ DETERMINISTIC
PORTLAND	TREND ANALYSIS/ EXPERT JUDGMENT	INCREMENTAL/ EXPERT JUDGMENT
VENTURA	TREND ANALYSIS EXPERT JUDGMENT	INCREMENTAL

FIGURE II-1

F. SUMMARY

Multi-year revenue and expenditure forecasts facilitate both impact analysis and gap analysis. The intent of impact analysis is to estimate the future budgetary implications of current decisions or external changes, while the goal of gap analysis is to anticipate revenue-expenditure imbalance.

Although few local governments systematically prepare multi-year forecasts, current revenue and expenditure forecasting theory offers several approaches with varying levels of sophistication. The four basic approaches discussed include: (1) expert judgment, (2) trend analysis, (3) deterministic techniques, and (4) statistical analysis (econometrics).

Regardless of the approach used by municipalities in projecting revenues, the following problems are common to each appraoch: (1) cleaning the tax revenue series of discretionary changes in the rate and base, (2) identifying the proper independent variable(s), (3) developing an appropriate model for the purposes of estimation, and (4) forecasting intergovernmental revenues.

Current forecasting literature provides little in the way of a systematic, analytic approach to expenditure forecasting. "Incrementalism," by far the most common approach used in forecasting municipal expenditures, adjusts current expenses for inflation as well as anticipated growth in real inputs caused by population growth and completion of capital facilities.

The insight obtained through the review of current forecasting theory and existing revenue and expenditure forecasting models forms the basis on which the City of Monterey's forecasting process was evaluated. The results of this evaluation, conducted as a management audit, are presented in Chapter III.

III. MANAGEMENT AUDIT OF MONTEREY, CALIFORNIA

During the period 10 September 1980 through 16 December 1980, an economy and efficiency audit of Monterey, California's revenue and expenditure forecasting process was accomplished by the authors [Ref. 34] in accordance with standards for auditing in the public sector as set forth by the United States General Accounting Office (GAO) [Ref. 35].

The purpose of this chapter is to discuss major elements of the audit leading to the results and recommendations which were formally presented to the City's management staff on 16 December 1980. The audit results and recommendations presented herein, together with the review of modern forecasting techniques as presented in Chapter II, form the basis for the revenue and expenditure forecasting model developed and presented in Chapter IV.

A. SCOPE OF AUDIT

The audit team directed its efforts towards determining if Monterey, California's revenue and expenditure forecasting process was being accomplished in the most efficient manner consistent with preferred management practices. Specifically, the audit was concerned with the following areas:

- Review of revenue and expenditure forecasting techniques available to municipal governments.

- Organizational structure for the revenue and expenditure forecasting process.
- The budget formulation process.

The audit did not presume to make a determination of the limitations on management caused by the size of the management staff or the cost of implementing budget formulation and forecasting techniques. The absence of or inefficiencies associated with preferred management practices within the three specific areas cited above were noted. Applicability of preferred management practices in those areas where deficiencies were noted will be addressed in Chapter IV.

B. SUMMARY REPORT OF PRELIMINARY SURVEY

1. Objective

The preliminary survey objective was to obtain background and general information on all aspects of the City of Monterey's process for forecasting revenues and expenditures.

2. Scope

The survey included a review of available revenue and expenditure forecasting techniques recognized by leading authorities in the field of municipal government, identification of Monterey's organizational structure for the revenue and expenditure forecasting process, and familiarization with the City's overall budget formulation process.

3. Work Performed

Review of available revenue and expenditure forecasting techniques was accomplished by researching periodicals,

books, proceedings from recent workshops and symposiums, and publications by leading authorities in the field of municipal government including the League of Cities, the Urban Consortium, and the United States Department of Housing and Urban Development. Appendix A provides a list of sources of preferred management practices used to formulate and support the audit objective.

Identification of Monterey's organizational structure for the revenue and expenditure forecasting process and familiarization with the City's overall budget formulation process was accomplished by a series of interviews with City officials as follows:

Date	Personnel Interviewed
10 September 1980	Administrative Analyst Finance Director
2 October 1980	Finance Director Revenue Officer
3 October 1980	Principal Planners (2)
5 November 1980	Revenue Officer

4. Results Achieved from Literature Review

Concepts and concerns of leading authorities in the field of municipal government considered relevant to the audit objective are as follows: [Ref. 36]

a. Available Forecasting Techniques

Revenue and expenditure forecasting techniques currently available to municipal governments can be categorized as expert judgment, trend analysis, deterministic methods, and statistical analysis.

b. Simplicity

For municipalities with a population of 100,000 or less, the process for revenue and expenditure forecasting should be simplistic. The use of sophisticated methods based on statistical analysis should be avoided on the assumption that such municipal government staffs normally do not include the statisticians and economists necessary to develop and maintain such a system. Furthermore, the results of such forecasts would be difficult to explain in other than technical terms which would likely cause skepticism and a low level of confidence by city officials as to their value for financial decision making and as inputs to the budget formulation process.

c. Closing of the Gap between Revenues and Expenditures

Recent tax revolts have resulted in enactment of legislation which limits the ability of state and municipal governments to generate revenues. In addition, the impact of inflation on municipal finances has resulted in expenditures increasing at a faster rate than revenues. Thus, the gap between revenues and expenditures is closing and in some cases has resulted in deficits such as those which prevail in the cities of New York and Cleveland.

5. Results Achieved from the 10 September 1980 Interview [Ref. 37]

a. Primary Point of Contact

Based on the objective and scope of the audit, it was agreed that the City's Administrative Analyst,

Mr. Ralph Bailey, would serve as the primary point of contact for the audit, recognizing that considerable involvement of the Finance Director, Mr. Dewey Evans, and the Revenue Officer, Miss Marie Mlacnik, would be required.

b. Concern of City Officials

During the course of the interview, both Mr. Evans and Mr. Bailey expressed concern for the lack of capability to project revenues and expenditures beyond the budget year.

c. Organizational Structure

The City of Monterey's organization for government functions is described in Figure III-1.

6. Results Achieved from the 2 October 1980 Interview [Ref. 38]

a. Points of Contact

For all matters relating to identification of Monterey's organization involved in the revenue and expenditure forecasting process and budget formulation process, the Finance Director and Revenue Officer would serve as primary points of contact.

b. The Revenue and Expenditure Forecasting Process

The forecasting process for both revenues and expenditures is accomplished annually as part of the budget formulation process. Revenue forecasts are developed by the Revenue Officer for all revenue sources except those which are under direct management control of departments other than the Finance Department. Expenditure forecasts are provided in the form of proposed departmental budget requests

ORGANIZATION CHART
CITY OF MONTEREY, CALIFORNIA

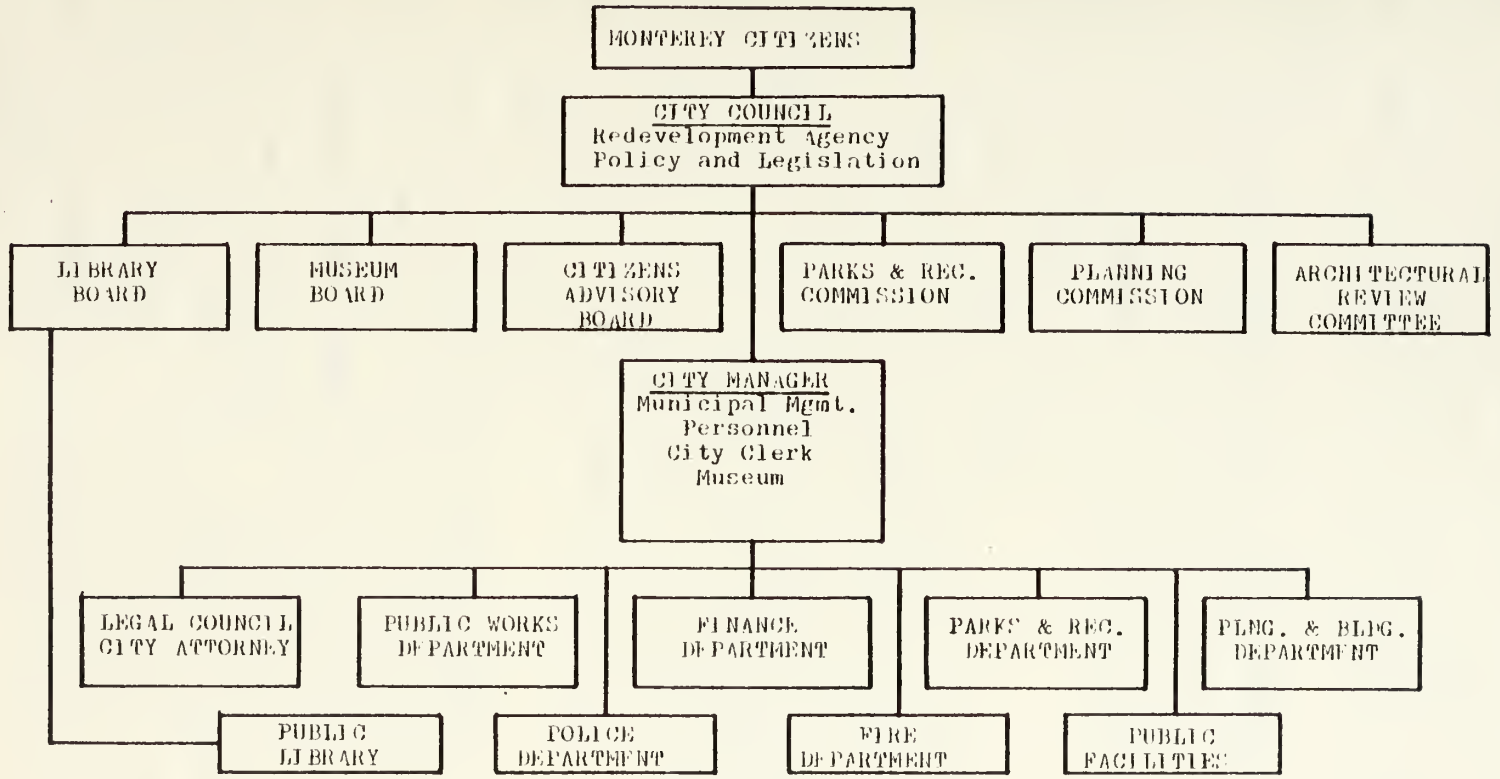

FIGURE III-1

which take into consideration the City's projected capital improvement requirements which - in the judgement of the departments - will impact on their resource requirements for the budtet year period. Projections of revenues and expenditures are limited to the twelve month period constituting the budget year.

c. Monitoring Receipts and Disbursements

During the budget execution period, revenues and expenditures are monitored in the form of routine monthly receipts and disbursements reports.

d. Concern for the Future

Although multi-year revenue and expenditure forecasting is not accomplished, concern for the future is recognized by the Finance Director and documented periodically in a memorandum to the City Manager. The memorandum presents revenue and expenditure trends based on historical data and the "expert judgement" of the Finance Director.

e. Budget Formulation

The City of Monterey budgets annually on a traditional line item basis oriented towards organizational structure. Revenues are identified by accounts of which there are eight major categories. Major sources of revenue include property tax, sales tax, transient occupancy tax, and intergovernmental transfers. Expenditures are broken down by department and presented in accounts which identify objects of expenditure such as salaries, office supplies, training, travel, maintenance, and contractual services. A

flow chart of the process for budget formulation is provided in Figure III-2.

7. Results Achieved from the 3 October 1980 Interview [Ref. 39]

a. Community Development Needs, Trends, and Forecasts

The interview with key Planning Department officials revealed that considerable effort is being put forth in the area of capital improvements. Community development needs, trends, and forecasts projected over a five year period are documented and reported in November of each year by the Planning Department.

b. Capital Improvement Program

The City's capital improvement requirements are categorized by program (police and fire, transportation, harbor, utilities, etc.), prioritized, projected over a five year period, and documented annually in a report called the City of Monterey Capital Improvement Program. Information contained in the report is updated routinely by a monthly status report.

c. Capital Improvements and Budget Formulation

According to one of the City's primary planners, Mr. Fell, the Community Development Needs, Trends, and Forecasts Report is used by individual departments during the budget formulation process in that it's impact on revenues and expenditures is evaluated and incorporated into the departments' budget requests as appropriate.

BUDGET FORMULATION PROCESS
CITY OF MONTEREY, CALIFORNIA

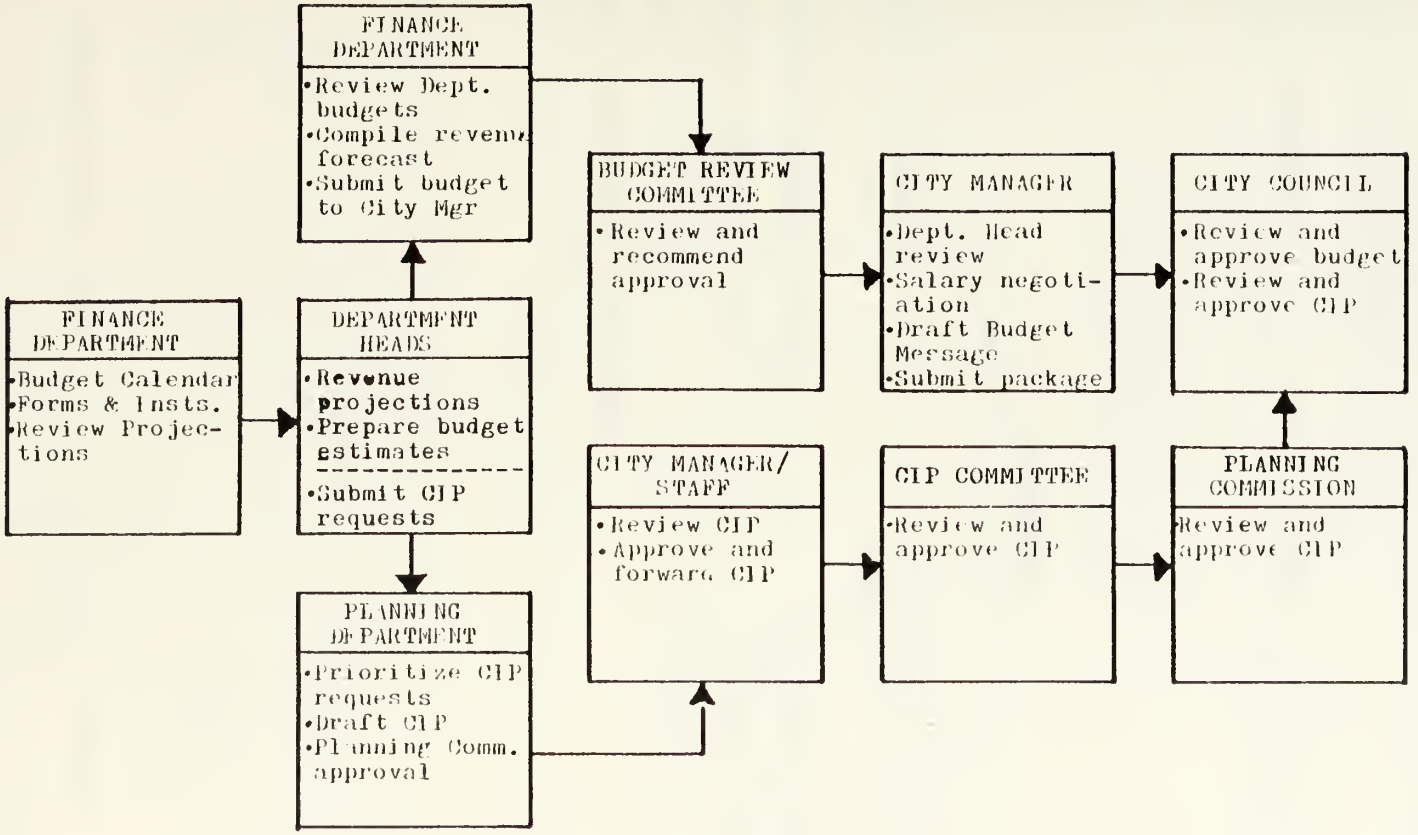

FIGURE III-2

8. Results Achieved from the 5 November 1980 Interview [Ref. 40]

a. Organizational Structure

Composition of the City of Monterey's Finance Department is shown in Figure III-3.

CITY OF MONTEREY FINANCE DEPARTMENT ORGANIZATION

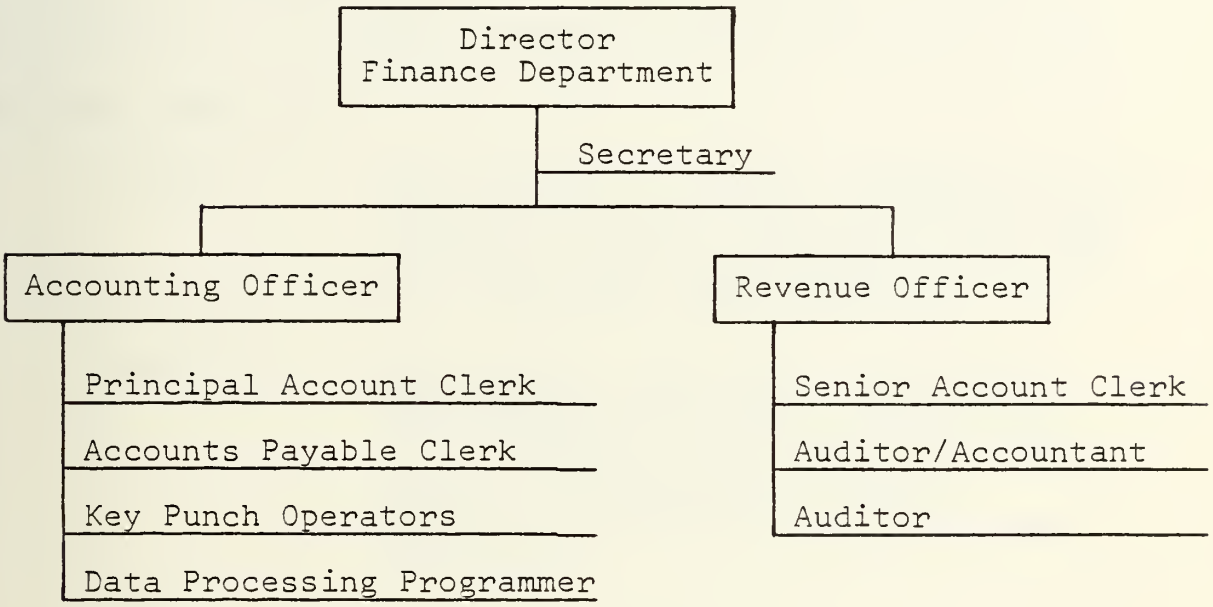

FIGURE III-3

b. Policies and Procedures

The City of Monterey has no formally documented manuals regarding policies and procedures for its revenue and expenditure forecasting process or the overall line-item budget formulation process. For purposes of revenue forecasting, guide manuals developed by the State Board of Equalization are used where applicable. Other locally generated revenues are forecasted on the basis of expert judgement and incremental trend analysis accomplished by the

Revenue Officer and in some cases by departments with cognizance over specific revenue accounts.

9. Conclusion

Based on the evidence and background information obtained as a result of the literature search and interviews constituting the preliminary survey, a detailed examination of the City's process for revenue and expenditure forecasting proceeded on the basis of the following tentative audit objective: [Ref. 41].

Causes. . . . Has utilization by the Management staff of the City of Monterey, California of available revenue and expenditure data in their budget formulation and financial decision making processes. . .

Criteria. . . considered revenue and expenditure forecasting techniques including expert judgement, trend analysis, deterministic methods, and statistical analysis recognized by leading authorities in the field of municipal government. . .

Effects . . . resulted in implementation of an effective revenue and expenditure forecasting process which recognized factors (state and federal legislation and regulations, demographic changes, level of economic activity, and inflation) with potentially significant financial impact to permit timely adjustments to service levels and development plans, and to arrange additional financing as appropriate.

C. SUMMARY REPORT OF THE DETAILED EXAMINATION [Ref. 42]

1. Objective of the Detailed Examination

The objective of the detailed examination was to obtain sufficient, competent, relevant, and material evidence on the tentative audit objective to determine the following:

- Acceptability of the criteria.
- Specific action or lack of action within or outside of the responsible organization which caused the effects.
- Significance of the effects.

2. Work Performed [Ref. 43]

To guide the detailed examination effort, an audit program was developed which consisted of a portion of the "Budget Management Questionnaire" contained in Auditing in the Public Sector, provided herein as Appendix B [Ref. 44]. Additional questions developed by the audit team and included in the audit program are provided herein as Appendix C. The audit program was executed primarily through interviews conducted with key city officials as follows:

Date	Person Interviewed
1 December 1980	Finance Director
4 December 1980	Administrative Analyst
8 December 1980	Revenue Officer

3. Results Achieved [Ref. 45]

a. Findings of Preferred Practices

(1) Executive Planning. While revenue and expenditure forecasts are limited to annual projections, the Capital Improvement Program and the Community Development Needs, Trends, and Forecasts Report prepared by the Planning Department were considered workable long range planning documents.

(2) Budget Formulation. The City's decision to adopt a program budget was considered a step toward more

effective management control in that the program budget will provide an effective link between long range planning and budgeting.

(3) Budget Calendar. The existence of a budget calendar assists in the timely completion of the budget formulation process.

(4) High Degree of Accuracy. In consideration of the complexity of municipal finances, currently developed twelve-month revenue and expenditure forecasts have a high degree of accuracy.

b. Deficiency Findings

(1) Organization and Management.

(a) Designated Budget Officer. The duties and responsibilities of the Budget Officer were not formally assigned.

(i) Preferred Practice. The budgeting function must have a defined organizational structure. Normally, the budgeting function is headed by a budget director or officer who reports directly to the chief executive.

(ii) Effect. The absence of a formally designated Budget Officer made it impossible to establish accountability for the budget process.

(iii) Recommendation. The duties and responsibilities of the Budget Officer should be formally assigned to a single individual.

(b) Long Range Plans. While organizational long range plans were reconciled with those of the

individual department for the capital improvement program, departmental budget requests did not reflect long range plans.

(i) Preferred Practice. Departmental budget requests should stem from long range plans of the department which, in turn, should be based on organizational long range plans.

(ii) Effect. Performance of departments toward accomplishing organization long term plans could not be measured, and budget requests could not be effectively reviewed for compatability with organizational long range planning.

(iii) Recommendation. Organizational long range plans should be translated into subsets of departmental long range plans, and budget requests should be formatted to reflect long range planning.

(2) Budget Formulation.

(a) Delinquent Revenues. Reliable estimates of delinquent revenue did not exist.

(i) Preferred Practice. Assumptions concerning significant increases in revenue must give consideration to the amount of delinquent revenue.

(ii) Effect. Revenue projections were subject to error due to the lack of reliable estimates of delinquent revenue which might be collected during the forecast period. In addition, the fact that receivables were not captured by the accounting system made timely follow-up on delinquent revenues impossible.

(iii) Recommendation. A procedure which captures receivables should be developed and incorporated into the accounting system. The amount of delinquent revenue, if significant, should be included in revenue projections.

(b) Budget Guidance. The executive policy statement regarding budget formulation was deficient in terms of multi-year budgeting in the following areas:

- Broad goals and policies were not translated into individual departmental goals and objectives.
- The general level of revenue and expenditures for the projected budget year was not provided.
- Estimates of expected cost reductions for the year by department were not provided.

(i) Preferred Practice. Among other things, the executive policy statement and related policy documents should: (1) translate broad goals and policies into departmental goals and objectives, (2) contain the general level of revenue and expenditures for the budget year, and (3) provide estimates of expected cost reductions for each department.

(ii) Effect. The lack of adequate guidance in the executive policy statement resulted in incremental departmental budgets which failed to address goal and objectives. Furthermore, failure to provide departments with revenue and expenditure planning figures led to inefficiences in budget formulation while increasing the Budget Review Staff workload.

(iii) Recommendations. Overall budget formulation efficiency can be improved by including mutually

agreeable departmental goals and objectives, general levels of revenue and expenditures, and estimates of expected cost reductions in the executive policy statement.

(c) Departmental Goals and Objectives. Under the current system, department budgets did not include goals and objectives.

(i) Preferred Practice. Department budgets should include goals and objectives in line with those in the chief executive's policy statement.

(ii) Effect. Since departmental budget requests did not contain goals and objectives, departmental goals and organizational goals could not be checked for agreement. In addition, departmental performance could not be accurately measured and evaluated against either departmental or organizational goals and objectives.

(iii) Recommendation. Departmental goals and objectives should be included in budget requests to provide a link between planning and budgeting. This link is critical to effective program budgeting and is the basis for departmental performance measurement and evaluation.

(d) Composition of Budget Review Staff. The Budget Review Staff did not include a person with formal training in facilities management involved in the City's long range facilities planning process.

(i) Preferred Practice. The chief executive's budget review staff should be of sufficient size to ensure effective review and appraisal of department submissions.

(ii) Effect. The fact that a person with formal training in facilities management involved in the City's long long-range facilities planning process was not included on the Budget Review Staff further weakened the link between planning and budgeting.

(iii) Recommendation. A person with formal training in facilities management involved in the City's long range facilities planning process should be assigned to the Budget Review Staff.

(3) Revenue and Expenditure Forecasting.

(a) Impact Analysis. Current revenue and expenditure forecasts did not project the impact of current financial decisions on future revenues and expenditures.

(i) Preferred Practice. Leading experts in the field of municipal finance stress the importance of multi-year revenue and expenditure forecasting as a means of reflecting the impact of current financial decisions on future financial condition.

(ii) Effect. Current financial decisions were being made with inadequate information as to the long range impact of such decisions on future fiscal condition.

(iii) Recommendation. The City of Monterey, to facilitate financial impact analysis, should consider the acoption of a multi-year revenue and expenditure forecasting process.

(b) Gap Analysis. Recent state legislation has limited the taxing authority of California municipalities while inflation has generally caused expenditures to increase at a faster rate than revenues.

(i) Preferred Practice. In addition to impact analysis, current forecasting theory identifies gap analysis as an equally important benefit of multi-year revenue and expenditure forecasting.

(ii) Effect. With the gap between revenue and expenditures beginning to narrow, a twelve-month forecast does not provide sufficient advanced warning to enable municipal decision makers to take corrective action.

(iii) Recommendation. The City of Monterey should consider implementation of a multi-year revenue and expenditure forecasting process to permit timely and necessary adjustments to municipal service levels, modification of long range development programs, and arrangement for short and long term financing as appropriate.

D. THE MANAGEMENT LETTER

On 16 December 1980, the above findings of preferred practices and deficiency findings were reviewed by the City of Monterey's management staff and with their concurrence, a formal letter was issued containing these findings, together with a statement of the audit team's opinion as follows: [Ref. 46]

> Based on the results of the review, the City's organizational structure for the revenue and expenditure forecasting process was sound in that revenue

forecasting was coordinated by a single individual, the Revenue Officer, and expenditure forecasts were generated by the individual departments accountable for the actual expenditures.

Regarding the review of revenue and expenditure forecasting techniques currently available to municipal governments, it was the opinion of the audit team that consideration should be given to expanding the current revenue and expenditure forecasting process to a multi-year process. Recognizing that recent legislation has limited the taxing authority of California municipalities, that inflation has resulted in narrowing of the gap between revenues and expenditures, and the prospect that these conditions will prevail throughout the foreseeable future; a twelve month forecast such as that currently employed would not provide municipal decision makers sufficient advanced warning of the need for modification of planned expenditures.

Regarding the budget formulation process, it was the opinion of the audit team that implementation of program budgeting, which was currently in progress, was a vital first step toward effectively linking long range management planning to the budget process. Effective translation of long range plans into time-phased programs, however, would require an assessment of fiscal constraints for each of the respective program years. In the opinion of the audit team, this requirement provided another strong justification for employing a multi-year revenue and expenditure forecasting process as a means of providing the required fiscal constraints for each of the periods being programmed.

Regarding the mechanics of budget formulation, it was the audit team's opinion that the organization for the process was sound and consistent with preferred management practices, but that overall effectiveness could be improved by tailoring overall management program goals and objectives into subsets for each department, and requiring departments to justify their budget requests in terms of their own goals. This would facilitate measurement of departmental performance toward accomplishment of programs, and would strengthen the overall effectiveness of the management control system. The audit team also felt that the budget review committee should include a person with formal training in facilities planning management involved in the City's long range facilities planning process. This would strengthen the committee's review of budget requests from the standpoint of multi-year programming.

E. SUMMARY

Monterey, California's organizational structure for revenue and expenditure forecasting is basically sound. In the audit team's opinion, however, consideration should be given to expanding the current forecasting process to a multi-year projection, which in turn would provide the basis for gap and impact analysis as recommended by leading authorities in the field of municipal government. The audit team recognized the City's need to link long range management-planning to the budget process and viewed multi-year revenue and expenditure forecasting as a vital step toward effectively accomplishing that initiative. Regarding the City's intent to implement program budgeting, multi-year revenue and expenditure projections would provide assessments of the fiscal constraints for each of the respective program years. In the audit team's opinion, the requirement for establishing these fiscal constraints provided another strong justification for employing a multi-year revenue and expenditure forecasting process.

The management audit of Monterey provided insight into the City's organizational structure and processes for revenue and expenditure forecasting and budget formulation, together with identification of the shortcomings of a one-year forecasting process. Chapter IV will build on this knowledge and develop a systematic but generalized approach for development and implementation of a multi-year revenue and

expenditure forecasting process for use at the municipal government level.

IV. MULTI-YEAR REVENUE FORECAST MODEL

Although multi-year revenue forecasting models must be tailored to the specific economic, political, and financial conditions of the municipalities for which they are designed, the basic steps and related problems involved in their development are similar and can be discussed in general terms [Ref. 47]. The purpose of this chapter is to outline the basic steps and problems associated with developing a multi-year revenue forecasting model in such a way that the outline could be used as a guide by municipalities for developing their own models.

The approach developed herein served as the basis for the authors' development of a five-year revenue forecasting model for the City of Monterey, California. To provide more detailed insight, each of the basic steps in the generalized approach will be supplemented with the specific example of its application as it pertains to the Monterey, California model.

Further, the generalized approach and specific examples will be limited to general fund revenues. Although models would likely include other sources of revenue such as special funds, a discussion of other than general fund revenues would contribute little toward the purpose of outlining a generalized approach to multi-year revenue forecasting. For this reason, Chapter IV will be limited to development of a

medium range (five year) multi-year revenue forecasting model for municipalities with a population of 100,000 or less.

A. OVERVIEW OF THE DEVELOPMENT PROCESS

Keeping in mind that a multi-year revenue forecast will ultimately serve as a management tool within the budget formulation process, provide the fiscal constraints for linking the long range planning process to program budgeting, and play a vital role in gap and impact analysis, the process for its development and subsequent updating must be integrated into the management systems it will serve. Thus, it is essential from the authors' point of view that managers and decision makers who will be using the model be included and involved in its development and periodic updates. This approach will enhance the quality and credibility of the model and greatly minimize the barriers of implementation into the overall management system, which was the case in developing the Monterey, California model.

A diagram of the overall process for multi-year revenue forecast model development for a typical municipality is provided in Figure IV-1 and is considered representative of the generalized approach recognized by leading authorities in municipal government [Ref. 48]. The discussion which follows is keyed to the steps specifically identified in Figure IV-1.

PROCESS FOR MULTI-YEAR REVENUE FORECAST MODEL DEVELOPMENT

A GENERALIZED APPROACH

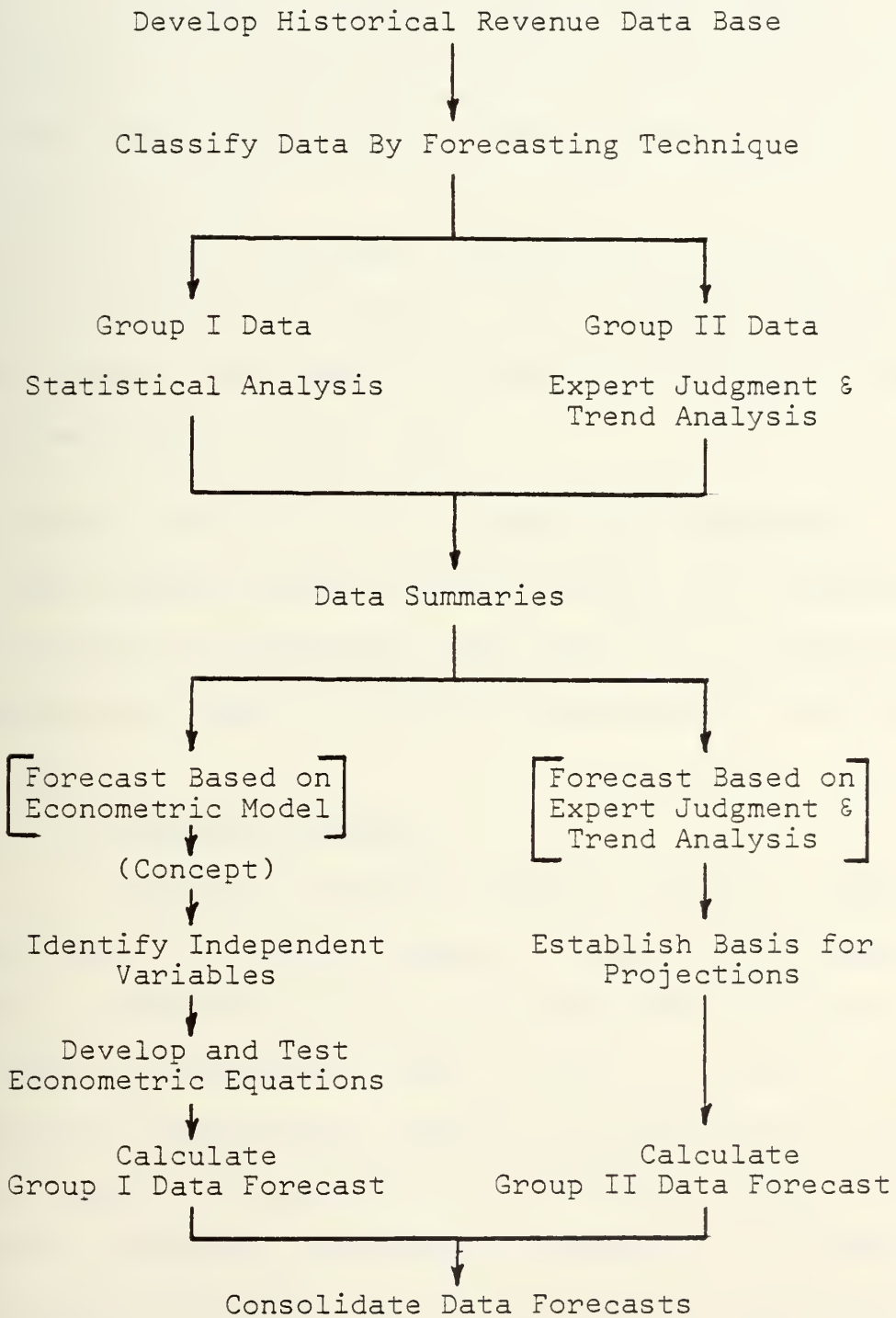
Develop Historical Revenue Data Base
Classify Data By Forecasting Technique
Group I Data
Statistical Analysis
Group II Data
Expert Judgment & Trend Analysis
Data Summaries
Forecast Based on Econometric Model
(Concept)
Identify Independent Variables
Develop and Test Econometric Equations
Calculate Group I Data Forecast
Forecast Based on Expert Judgment & Trend Analysis
Establish Basis for Projections
Calculate Group II Data Forecast
Consolidate Data Forecasts

FIGURE IV-1

B. DEVELOPING THE HISTORICAL DATA BASE

The necessary first step is the straightforward task of collecting data streams for each active revenue account which will serve as the basis for all subsequent steps in the process. If possible, the data streams should include a 10 to 15 year history of revenue collections to provide a meaningful long-term representation of each revenue account's behavior [Ref. 49].

In the case of Monterey, California, this step in the process required little effort since a summary report of annual revenues was readily available and routinely updated at the end of each fiscal year.

C. CLASSIFICATION OF DATA BY FORECASTING TECHNIQUE

While revenue sources may vary widely from municipality to municipality, authorities agree that for any given set of circumstances, there is an optimal forecasting technique: [Ref. 50].

1. Statistical Analysis

A statistical analysis approach should be used for revenue accounts that are strongly influenced by changes in economic conditions and for which sufficient historical data (10 years) is available. The 10 year data stream is required to develop an estimating equation by regressing the annual revenue amounts (dependent variables) against their causal economic indicators (independent variables). A discussion of regression analysis will be provided in a later section of this chapter.

2. Expert Judgment

This approach should be employed to forecast revenues that are highly variable, have no history, or are strongly influenced by political considerations or one's relative position with respect to other jurisdictions (e.g. intergovernmental revenues).

3. Trend Analysis

Including the use of time series analysis, trend analysis should be used to forecast revenues that are not highly variable and (a) amount to minor percentages of the budget, or (b) are not dependent upon economic or political considerations.

Before each of the revenue accounts included in the historical data base can be categorized by forecasting technique, (a) the formulae resulting in revenues and the legal framework of the municipality's government finance should be thoroughly understood, and (b) a basic knowledge of the municipality's authority to finance should be attained.

With a clear understanding of the municipality's revenue formulae, legal framework, and the limits of financial authority, revenue accounts included in the historical data base can be readily matched with the forecasting technique for which it is best suited.

For Monterey, California, categorization of revenue accounts by forecasting technique resulted in approximately 73 percent of the general fund revenue being earmarked for the statistical method (Group I) with the remaining Group II

data categorized almost exclusively as expert judgment. The detailed results of this categorization process are summarized in Table IV-1.

At this point in the process, one can compile data summaries for the Group I and II methods. The next step is to proceed with development of the revenue forecast for Group I data and then return and do the same for Group II.

D. FORECAST BASED ON THE ECONOMETRIC MODEL

1. Concept

Rather than basing revenue projections solely on the past history of revenue receipts, the statistical (econometric) method takes into consideration many crucial factors outside the realm of the local government structure including economic, social, and demographic changes in the community. In this sense, the statistical method, which applies the tools of probability and statistics to economic problems, goes to the heart of the factors which cause revenues to increase or decrease [Ref. 51].

The basic concept of econometrics is that fluctuations in revenue (the dependent variable) are related to and dependent on changes in certain economic indicators (independent variables). A process referred to as multiple linear regression analysis provides mathematical equations which represent the relationships between the dependent and one or more independent variables. The degree of precision with which these equations can predict revenue depends on the proper selection of all independent variables which have

TABLE IV-1

CLASSIFICATION OF REVENUES BY FORECASTING TECHNIQUE

CITY OF MONTEREY, CALIFORNIA

(BASED ON 1980-81 BUDGET)

Budget Category	Account Number	Account Description	Forecast Technique
Taxes	3010	Property Tax (secured)	Statistical
	3020	Property Tax (unsecured)	"
	3030	Property Tax (prior year)	"
	3040	Penalties on Property Tax	"
	3050	Utility Users Tax	"
	3060	Sales Tax	"
	3080	Franchises	"
	3091	Business Licenses	"
	3092	Documentary Transfer Tax	Expert Judgment
	3093	Scuba Tank Tax	" "
Licenses and Permits	3110	Animal Licenses	Statistical
	3130	Construction Permits	"
	3131	Residential Inspection	"
	3132	Water Meter Application	"
	3150	Street Opening Permit	"
	3190	Other Licenses and Permits	"
Fines, Forfeits, and Penalties	3210	Vehicle Code Fines	Expert Judgment
	3220	Other Court Fines	" "
	3290	Other Fines	" "

TABLE IV-1 CONTINUED

Budget Category	Account Number	Account Description	Forecast Technique
Revenue from Use of Money and Property	3310	Interest Income	Expert Judgment
	3320	Rental Income	Trend Analysis
	3330	Sewer Rental	" "
		Conference Center	
	3341	Room Rental	Expert Judgment
	3342	Food and Beverage	" "
	3343	Labor	" "
	3344	Miscellaneous	" "
	3345	Equipment Rental	" "
Revenue from Other Agencies	3409	Sanitation District	Expert Judgment
	3410	Alcoholic Beverage Fees	Statistical
	3421	Motor Vehicle in Lieu	"
	3422	Off Highway License Fees	"
	3431	Gas Tax Maintenance	"
	3432	Gas Tax Engineering	"
	3440	Homeowners Tax Relief	"
	3445	Property Tax Relief - SB 154	Expert Judgment
	3450	Business Inventory Tax Relief	Statistical
	3460	Trailer Coach in Lieu	"
	3470	Cigarette Tax	"
	3490	Other Reimbursable State	Expert Judgment
	3494	Highway Carriers License Tax	" "
	3495	Reimbursable Mandated Costs	" "
Charges for Current Services	3610	Zoning and Subdivisions	Statistical
	3620	Sale of Publications	"
	3630	Police Services	"

Budget Category	Account Number	Account Description	Forecast Technique
Charges for Current Services	3640	Fire Service Charge	Statistical
	3650	Plan Checking Fees	"
	3651	Architectural Review Committee	"
	3660	Animal Shelter Fees	"
	3670	Public Works Services	"
	3720	Library Fines and Fees	"
	3730	Recreation Services	"
	3750	Environmental Impact Fees	"
	3751	E.I.R. Consultant Fees	"
	3752	Condoversion Fees	"
	3790	Other Current Services	"
Other Revenue	3810	Sale of Real or Personal Property	Expert Judgment
	3820	Damage to City Property	" "
	3833	Miscellaneous Refunds	" "
	3835	Reimbursable Costs	" "
	3870	Contributions	" "
	3890	Other Revenue	" "
Transfers from Special Funds	43.01	Transient Occupancy Tax - Conference Facilities	Statistical
	43.02	Harbor Development	"
	50.01	Revenue Sharing - General	Expert Judgment
	56	Sewer Line Maintenance	" "

a significant causal relationship with the revenue in question. Although selection of independent variables is normally done on a trial and error basis, the same independent variables -- personal income, population, and inflation -- turn up in most econometric equations [Ref. 52].

Considerable technical training is necessary to grasp the statistical theory upon which econometric equations are formulated and tested. Furthermore, development of the equations is highly dependent upon the use of computers. Software packages have been designed to aid in the development of econometric equations and can be easily adapted to a wide variety of computer systems. Although these software packages are relatively inexpensive, purchase and application without technically qualified supervision is not advisable. For municipalities without personnel technically trained in this area, it would be more practical to purchase the technical services required to generate and periodically update the econometric equations.

Although development of the equations is technical in nature and requires the aid of a computer, the equations themselves are nothing more than algebraic expressions which can be readily understood and used in calculating the Group I data forecast.

2. Identify the Independent Variables

Once the Group I data base has been established, the independent or causal variables for each revenue account must be determined. A practical and possibly timesaving

approach would be to identify values for those independent variables most commonly found in econometric equations -- population, personal income, and inflation -- which correspond to the timeframes of each value of the revenue data stream. Then, input all the dependent and independent variable data into the computer. If an independent variable is inappropriate, the computer will automatically reject it. Conversely, if the selection of independent variables is correct but an important variable has been omitted, the resulting equation will be of poor quality. Thus, the computer can be used to aid in this trial and error approach, minimizing the effort required in selection of appropriate independent variables.

It is essential to note that the quantity of independent variables employed in any econometric equation should be limited to not more than four or five. While use of more variables might improve the percentage of explained variance of predicted revenue values to actual values, the contribution of additional variables beyond five becomes insignificant. Keep in mind, too, that once the econometric equations have been established, values for each of the independent variables must be projected for each year of the forecast. Thus, minimizing the number of independent variables and selecting only those for which reliable projections can be obtained is of the essence.

Monterey, California's Group I data was consolidated into nine dependent variables. The independent variables

were initially limited to the consumer price index for the for the San Francisco Bay area, Monterey County population, and Monterey County personal income and later expanded to include Monterey County taxable sales and the City of Monterey transient occupancy tax rate.

For computer application purposes, abbreviations for all dependent and independent variables were assigned. A listing of these abbreviations together with identification of sources from which independent variable data was obtained is provided in Table IV-2. Data streams for the dependent and independent variables are provided in Table IV-3 and Table IV-4, respectively.

3. Develop and Test the Econometric Equations

This step in the process entails direct interface with a computer to perform the multiple linear regression analysis described above. Concern should be focused on insuring that the resulting equations are straightforward and understandable, and that the standard error of the estimate is minimized to a value which produces an acceptable range of errors when comparing predicted revenues against actual historical data.

The equations included in Monterey, California's econometric model were developed by the authors of this citation at the Naval Postgraduate School Computer Center located in Monterey, California. The entire analysis was accomplished by employing a statistical analysis software package entitled "BMDPIR-Multiple Linear Regression"

TABLE IV-2

ABBREVIATIONS FOR GROUP I DATA ANALYSIS
CITY OF MONTEREY, CALIFORNIA

DEPENDENT VARIABLES (ANNUAL AMOUNTS OF REVENUE SOURCES)

AVP	Assessed valuation of property for Monterey County used as a basis for estimating annual tax revenue. AVP values for fiscal years 1970-80 were obtained from the Monterey County Assessor's Office (in $1,000,000's).
UUT	Utility Users Tax Revenue (in $1,000's)
STAX	Sales Tax Revenue (in $1,000's)
FRAN	Franchise Fees Revenue (in $1,000's)
BL	Business License Fees Revenue (in $1,000's)
LICPER	Licenses and Permits Revenue (in $1,000's)
ROA	Revenue from Other Agencies (in $1,000's)
CURSER	Charges for Current Services (in $1,000's)
TOT	Transient Occupancy Tax Revenue (in $1,000's)

INDEPENDENT VARIABLES (ECONOMIC INDICATORS AND TAX RATES)

CPI	Consumer Price Index (all urban consumers) for San Francisco Region obtained from the Bureau of Labor, Washington, D.C.
POP	Monterey County population obtained from the California Statistical Abstract published by the California Department of Finance, Sacramento, California (in 1,000's).
PI	County of Monterey personal income obtained from the County Fact Book published by the County Supervisors Association, Sacramento, California (in $1,000,000's).
TASX	Monterey County taxable sales obtained from the State Board of Equalization, Sacrament, California (in $1,000,000's).
TOTR	City of Monterey transient occupancy tax rate used as a basis for estimating TOT (%).

TABLE IV-3

GROUP I DATA BASE FOR DEPENDENT VARIABLES
CITY OF MONTEREY, CALIFORNIA

DEPENDENT VARIABLES FOR USE IN MULTIPLE REGRESSION ANAYLSIS

Fiscal Year	AVP $(000)	UUT $(000)	STAX $(000)	FRAN $(000)	BL $(000)	LICPER $(000)	ROA $(000)	CURSER $(000)	TOT $(000)
1970-71	68,408	236.8	996.7	75.5	144.5	40.2	511.0	119.0	336.0
1971-72	69,674	328.2	1125.4	82.8	153.7	48.4	513.8	101.6	374.0
1972-73	73,229	345.2	1347.4	85.4	170.7	53.6	535.3	178.1	501.0
1973-74	84,925	383.2	1424.7	98.5	184.2	42.8	652.1	248.2	553.2
1974-75	93,667	447.2	1624.5	110.4	203.1	58.3	690.0	399.1	620.0
1975-76	103,907	485.3	1699.8	141.7	212.0	70.8	699.3	345.7	747.0
1976-77	136,423	531.6	1757.3	149.6	237.3	60.2	706.3	406.2	872.9
1977-78	150,711	606.7	2132.9	163.6	267.2	69.2	776.1	388.6	990.0
1978-79	165,443	666.1	2302.4	164.5	530.7	71.7	804.0	377.2	1751.5
1979-80	176,933	718.9	2793.0	202.9	605.8	94.4	828.3	454.0	2215.1

TABLE IV-4

GROUP I DATA BASE FOR INDEPENDENT VARIABLES
CITY OF MONTEREY, CALIFORNIA

INDEPENDENT VARIABLES USED IN MULTIPLE REGRESSION ANALYSIS

Calendar Year	CPI	POP	PI $(000)	TAXS $(000)	TOTR (%)
1970	115.8	247,450	1,072,300	406,000	5
1971	120.1	252,800	1,209,600	454,000	5
1972	124.3	255,500	1,306,300	548,203	6
1973	131.5	260,200	1,469,700	627,768	6
1974	144.4	263,500	1,647,000	732,671	6
1975	159.1	267,600	1,812,300	811,265	6
1976	168.0	271,500	1,917,600	892,841	6
1977	180.0	275,100	2,245,000	1,087,930	6
1978	197.8	276,000	2,666,000	1,182,705	8
1979	214.6	281,000	2,826,826	1,366,978	8

Sources: California Statistical Abstract, California County Fact-book, CPI Detailed Report.

developed by the Health Sciences Computer Facility, University of California, Los Angeles, on an IBM-360 computer hardware system.

Initially, the independent variable data streams for CPI, POP, and PI contained in Table IV-4 were regressed on each of the dependent variable data streams contained in Table IV-3. The computer identified redundant independent variables and in some cases indicated the omission of a significant independent variable. Addition of taxable sales (TAXS) as an independent variable to the equations for sales tax (STAX) and business license tax (BL) and addition of the transient occupancy tax rate (TOTR) to the transient occupancy tax (TOT) equation greatly improved the results. The possibility of further improvement was checked by varying the exponential power of each of the independent variables from +1 to -1, +2, and +3. Use of log functions was also considered. This effort proved fruitful in the case of revenue generated from license and permit fees (LICPER) which resulted in changing the independent variable, CPI, to CPI^2.

The multiple linear regression analysis described above produced nine econometric equations with mean absolute percentage errors (MAPE) ranging from 2.14 to 12.66.

Econometric equations appear in the following form:

$$Y = 120.0 + 2.0\ (X_1) + 3.0\ (X_2)$$
$$\qquad\qquad (2.31) \qquad (4.10)$$

F ratio = 150.0
SEE = 6.57
R^2 = 0.90
MAPE = 5.12

Numbers in parentheses below the equation are "T - statistics" which are a ratio of the independent variable coefficients (immediately above them) to their estimated standard deviation. The F ratio is a measure of the significance of the coefficient of multiple determination, R^2. The standard error of the estimate (SEE) is a measure of the dispersion of actual and predicted revenue values (dependent variables) around the regression line. The coefficient of multiple determination, R^2, is the percentage of variance from Y which can be explained by the independent variables. Finally, the mean absolute percentage error (MAPE) is the sum of the absolute values of all estimation errors for each of the periods in the data base divided by the total number of periods [Ref. 53].

The nine equations comprising Monterey, California's econometric model are as follows:

$$AVP = -114.205 + 2.016\ (CPI) - 0.046\ (PI)$$
$$\qquad\qquad\qquad\quad (3.518) \qquad\quad (-1.425)$$

F ratio = 178.327
SEE = 6.57
R^2 = 0.9808
MAPE = 3.78

UUT = -1657.22 + 7.148 (POP) + 0.131 (PI)

(5.67) (5.65)

F ratio = 851.08
SEE = 11.3752
R^2 = 0.9959
MAPE = 2.14

STAX = 200.044 + 0.402 (PI) + 0.979 (TAXS)

(0.740) (0.937)

F ratio = 133.290
SEE = 100.7078
R^2 = 0.9744
MAPE = 3.45

FRAN = -136.114 + 2.611 (CPI) - 0.078 (PI)

(5.666) (-2.995)

F ratio = 294.763
SEE = 5.2840
R^2 = 0.9883
MAPE = 3.03

BL = 2[38.329 + 0.007 (CPI) + 0.139 (POP) + 0.174 (TAXS)]

(0.018) (0.159) (3.763)

F ratio = 287.269
SEE = 3.7691
R^2 = 0.9954
MAPE = 2.20

$$LICPER = 26.906 + 0.001\ (CPI)^2$$

(6.929)

F ratio = 48.012
SEE = 6.5166
R^2 = 0.8572
MAPE = 9.06

$$ROA = -2077.089 + 10.370\ (POP)$$

(12.13)

F ratio = 147.15
SEE = 28.3809
R^2 = 0.9484
MAPE = 3.53

$$CURSER = -4036.978 + 17.172\ (POP) - 0.120\ (PI)$$

(4.50) (-1.72)

F ratio = 56.184
SEE = 34.4796
R^2 = 0.9414
MAPE = 12.66

$$TOT = 6066.570 - 32.164\ (POP) + 1.298\ (PI) + 160.596\ (TOTR)$$

(-1.797) (2.888) (1.310)

F ratio = 56.316
SEE = 140.2050
R^2 = 0.9657
MAPE = 8.80

Test results for each of the above equations together with explanations of erros which differ significantly from the mean absolute percentage error (MAPE) are provided in Appendix D. It is normal that extremes in the percent errors occur, but it is essential that their underlying causes be identified and documented so that they can be considered when evaluating forecasts based on the econometric equation involved.

4. Calculate the Group I Data Forecast

The final step involves nothing more than mechanically calculating projected revenues for each equation in the econometric model. To do this, forecasted values of the independent variables for each year of the forecast period must be obtained. Obviously, discussion about the validity of the forecasted revenues will stem, at least in part, from the projected values of the independent variables. Thus, if the initial selection of variables used in developing the basis econometric equations is limited to reliable sources, defending the resulting forecasts will be much easier, and the model will have more credibility.

Projected values of the independnt variables used in Monterey, California's Group I revenue forecast, together with identification of their sources, is provided in Table IV-5. Detailed calculations of the forecast for each econometric equation are provided in Appendix F. A summary of the predicted revenues resulting from the detailed calculations, provided in Table IV-6, constitutes the econometric portion

TABLE IV-5

PROJECTED VALUES OF INDEPENDENT VARIABLES
GROUP I DATA BASE
CITY OF MONTEREY, CALIFORNIA

Fiscal Year	AVP $(000)	CPI	POP (000)	PI $(000,000)	TAXS $(000,000)	TOTR (%)
1980-81	237,672	247.3	290.0	3188.7	1421.0	8.0
1981-82	274,595	275.0	294.0	3600.0	1600.0	8.0
1982-83	306,333	300.6	298.0	4032.0	1792.0	8.0
1983-84	326,414	321.6	301.0	4515.8	2007.0	8.0
1984-85	346,846	344.1	307.0	5057.7	2247.9	8.0

Sources

AVP: Values for Fiscal Years 1980-85 are based on the AVP statistical equation developed herein.

CPI: Values for Fiscal Years 1980-85 were derived from the United States Bureau of Labor Statistics.

POP: Values were obtained from the California Department of Finance, Population Research Unit.

PI: Values for Fiscal Years 1980-82 are based on the United California Bank (UCB) forecast, Appendix E. Values for Fiscal Years 1982-85 assume an annual growth rate of 12% based on the California Department of Finance forecast dated 24 November 1980.

TAXS: Values for Fiscal Years 1980-82 are based on the United California Bank forecast, Appendix E. Values for Fiscal Years 1982-85 assume an annual growth rate of 12%.

TABLE IV-6

SUMMARY-GROUP I DATA FORECAST
CITY OF MONTEREY, CALIFORNIA
$(000's)

Revenue Category	1980-81	1981-82	1982-83	1983-84	1984-85
Taxes					
Property Tax	1,616.2	1,865.1	2,131.0	2,219.6	2,358.6
Utility Users Tax	833.4	915.9	1,001.1	1,085.9	1,199.8
Sales Tax	2,873.1	3,213.6	3,575.3	3,980.2	4,433.9
Franchise Tax	260.9	301.0	334.3	351.4	367.8
Business License Tax	655.2	719.0	787.3	863.3	949.1
Subtotal	6,238.8	7,014.6	7,829.0	8,500.4	9,309.2
Licenses and Permits	88.1	102.5	117.3	130.3	145.3
Revenue From Other Agencies	930.2	971.7	1,013.2	1,044.3	1,106.5
Charges For Current Services	560.3	579.6	596.4	589.9	627.9
Transfers From Special Funds	1,451.4	1,816.1	2,205.0	2,683.3	3,142.7
Total	9,268.8	10,484.5	11,760.9	12,948.2	14,331.6

of Monterey's five-year revenue forecast model. This concludes the outline for the forecast of Group I data. Now return to the Group II Data Base and develop the remaining portion of the multi-year revenue forecast.

E. FORECAST BASED ON EXPERT JUDGMENT AND TREND ANALYSIS

1. Establish a Basis for Projection and Calculate Group II Data Forecast

Because of the nature of these forecasting techniques, very little can be said about a generalized approach. Obviously, forecasts of this type must be accomplished by someone who has considerable knowledge of the revenue accounts involved and is aware of the impact of potential changes in the underlying causal variables.

Suggested steps for development of the Group II data forecast are as follows:

a. Review the formulae which result in revenues to identify causal variables.

b. Review the revenue data streams to identify trends or lack thereof.

c. Establish and document assumptions about the causal variables which will result in the estimates of future revenues.

d. Incorporate assumptions about the causal variables into the revenue formulae and calculate projected values for each year of the forecast period.

2. Group II Data Forecast for Monterey, California

Data streams for Monterey, California's Group II data base are provided in Table IV-7.

TABLE IV-7
GROUP II DATA BASE
CITY OF MONTEREY, CALIFORNIA
$(000)

BUDGET CATEGORY	ACCT. NO.	ACCOUNT DESCRIPTION	1970-71	1971-72	1972-73	1973-74	1974-75
TAXES	3092	DOCUMENTARY TRANSFER TAX	9.7	15.7	14.8	12.1	10.4
	3093	SCUBA TANK TAX	----	----	----	----	----
FINES, FORFEITS, AND PENALTIES	3210	VEHICLE CODE FINES	95.0	126.1	102.0	103.7	110.6
	3220	OTHER COURT FINES	64.7	91.2	108.6	118.8	115.4
	3290	OTHER FINES	0.1	0.1	----	----	0.1
REVENUE FROM USE OF MONEY AND PROPERTY	3310	INTEREST INCOME	108.3	117.2	151.1	281.6	310.6
	3320	RENTAL INCOME	106.0	125.1	134.8	155.8	149.9
	3330	SEWER RENTAL	18.0	20.8	23.0	27.2	29.0
	3341	CONF. CENTER-ROOM RENTAL	----	----	----	----	----
	3342	CONF. CENTER-FOOD & BEV.	----	----	----	----	----
	3343	CONF. CENTER-LABOR	----	----	----	----	----
	3344	CONF. CENTER-MISC.	----	----	----	----	----
	3345	CONF. CENTER-EQUIP RENTAL	----	----	----	----	----
REVENUE FROM OTHER AGENCIES	3409	SANITATION DISTRICT	----	----	----	----	----
	3445	PROPERTY TAX RELIEF-SB154	----	----	----	----	----
	3490	OTHER REIMBURSABLE-STATE	----	----	----	----	----
	3494	HIGHWAY CARRIER LICENSE TAX	----	----	----	----	----
	3495	REIMBURSABLE MANDATED COSTS	----	----	----	----	----
OTHER REVENUE	3810	SALE OF REAL OR PERS. PROP.	3.2	1.9	2.3	1.8	4.2
	3820	DAMAGE TO CITY PROPERTY	1.2	6.7	6.6	4.0	2.7
	3833	MISCELLANEOUS REFUNDS	1.9	10.3	6.9	1.4	8.0
	3835	REIMBURSABLE COSTS	----	----	----	----	----
	3870	CONTRIBUTIONS	----	----	----	----	2.6
	3890	OTHER REVENUE	4.0	0.1	0.1	0.1	----

TABLE IV-7 CONTINUED

BUDGET CATEGORY	ACCT. NO.	ACCOUNT DESCRIPTION	1975-76	1976-77	1977-78	1978-79	1979-80
TAXES	3092	DOCUMENTARY TRANSFER TAX	26.1	31.3	47.1	32.8	35.7
	3093	SCUBA TANK TAX	----	2.8	3.4	1.8	1.0
FINES, FORFEITS,	3210	VEHICLE CODE FINES	103.7	138.0	157.9	120.6	217.1
AND PENALTIES	3220	OTHER COURT FINES	195.8	218.7	246.2	180.4	41.7
	3290	OTHER FINES	0.2	0.5	0.8	0.3	0.1
REVENUE FROM	3310	INTEREST INCOME	170.0	164.8	209.6	398.2	800.5
USE OF MONEY	3320	RENTAL INCOME	150.0	152.5	199.2	294.2	323.8
AND PROPERTY	3330	SEWER RENTAL	42.3	42.2	34.6	19.6	14.5
	3341	CONF. CENTER-ROOM RENTAL	----	0.3	68.1	138.4	114.9
	3342	CONF. CENTER-FOOD & BEV.	----	----	16.5	24.0	26.7
	3343	CONF. CENTER-LABOR	----	----	----	5.1	9.8
	3344	CONF. CENTER-MISC.	----	----	----	0.4	2.2
	3345	CONF. CENTER-EQUIP RENTAL	----	----	----	----	4.6
REVENUE FROM	3409	SANITATION DISTRICT	----	----	86.5	12.0	86.5
OTHER AGENCIES	3445	PROPERTY TAX RELIEF-SB154	----	----	----	350.5	----
	3490	OTHER REIMBURSABLE-STATE	12.5	180.0	----	----	----
	3494	HIGHWAY CARRIER LICENSE TAX	----	----	3.6	4.0	3.3
	3495	REIMBURSABLE MANDATED COSTS	----	----	20.2	----	4.9
OTHER REVENUE	3810	SALE OF REAL OR PERS. PROP.	1.7	3.7	1.4	2.1	0.4
	3820	DAMAGE TO CITY PROPERTY	1.5	4.6	5.5	3.8	21.9
	3833	MISCELLANEOUS REFUNDS	9.3	3.0	193.2	29.2	0.2
	3835	REIMBURSABLE COSTS	----	----	----	997.4	----
	3870	CONTRIBUTIONS	6.0	----	----	----	----
	3890	OTHER REVENUE	1.5	----	----	4.3	1.5

Based on fiscal year 1979-80 figures, these revenues account for approximately 27 percent of the City's general fund revenues. The Group II data forecast is based on the expert judgment of Monterey's Finance Director [Ref. 54]. His assumptions regarding projected inflation rates for the forecast period (1981-1985) were adjusted slightly to conform to the CPI projections used in the Group I data forecast. All other assumptions regarding causal variables are essentially the same.

A listing of the major assumptions used as a basis for the Group II data forecast are as follows:

a. Taxes

(1) Documentary Transfer Tax.

- Tax rate assumed to remain constant.
- Property turnover rate assumed to vary as follows:

FY 1981-82	10%
1982-83	9%
1983-85	7%

(2) Scuba Tank Tax. Revenue assumed to remain at a constant $2000 throughout the forecast period.

b. Fines, Forfeits, and Penalties (all accounts)

Revenues from these sources is assumed to remain constant throughout the forecast period at the $260,000 level budgeted for 1980-81.

c. Revenues from Use of Money and Property

(1) Interest Income

- Cash balances will be based on the assumption that annual revenues will cover annual operating expenses and debt service.

- FY 1981-82 interest rate will be 12%.
- FY 1982-85 money previously invested will be reinvested at 9% annually.
- FY 1980-85 capital improvement projects will be constructed on time.

(2) Rental Income

- Quantity of rental property will remain constant throughout the forecast period.
- Rental rates for Wharf I will be increased to 3.5% in FY 1981-82 and 4.0% in FY 1982-85.
- Rental rates on other properties will rise by 10% in FY 1981-82, 6% in FY 1982-83, and 5% for FY 1983-85.

(3) Conference Center

- The Center is approaching maximum usage.
- Rates will remain constant throughout the forecast period.
- Real growth of revenue for each of the next four years will be at 5% per year.

d. Revenue from Other Agencies

(1) Sanitation District

- Revenue assumed to be constant at $74,500 throughout the forecast period.

(2) Property Tax Relief - SB 154

- Revenue assumed to be constant at $-0 throughout the forecast period.

(3) Other Reimbursable - State

- For FY 1980-81, assume the budgeted amount of $15,000.
- Revenue assumed to increase by 11.2% in
- FY 1981-82, 9.3% in FY 1982-83, and 7% for FY 1983-85.

(4) Highway Carriers License Fees

- For FY 1980-81, assume the budgeted amount of $5600.
- Revenue assumed to increase by 11.2% in FY 1981-82, 9.3% in FY 1982-83, and 7.0% for FY 1983-85.

(5) Reimbursable Mandated Costs

- For FY 1980-81, assume a revised estimated figure of $27,000.
- For FY 1981-85, assume the budgeted amount of $4,000 per year to be constant.

e. Other Revenue (all accounts)

Assume the FY 1980-81 budgeted amount of $12,600 to remain constant throughout the forecast period.

f. Transfers from Special Funds

(1) Revenue Sharing - General

- Assume continuation of General Revenue Sharing to 1 October 1983 at which time it will be discontinued.
- For FY 1980-81, assume $508,693.
- For FY 1981-83, assume $594,000 per year.
- For FY 1983-84, assume $262,000.

(2) Sewer Line Maintenance

- Rates will remain constant throughout the forecast period.
- For FY 1980-81, assume the budgeted amount of $222,943.
- For FY 1981-85, assume a real growth of 3% annually.

A summary of the Group II Data Forecast based on the assumptions outlined above is provided in Table IV-8. This concludes the outline for the forecast of Group II data.

F. CONSOLIDATE THE GROUP I AND GROUP II DATA FORECASTS

This is perhaps the simplest task in the entire process. All that needs to be done at this point is to assemble the Group I and Group II data forecasts into the familiar budget format. Presentation in budget format is considered essential because it provides a basis for comparing prior year forecasts with actual revenues collected and will facilitate its usefulness as an effective management tool.

TABLE IV-8

SUMMARY-GROUP II DATA FORECAST
CITY OF MONTEREY, CALIFORNIA
$(000's)

Revenue Category	1980-81	1981-82	1982-83	1983-84	1984-85
Taxes	32,000	35,000	38,000	40,000	43,000
Fines, Forfeits, Penalties	260,100	260,100	260,100	260,100	260,100
Revenue From Use of Money and Property					
Interest Income	1,000,000	750,000	700,000	700,000	700,000
Rental Income	393,000	491,000	600,000	630,000	660,000
Conference Center	215,000	226,000	237,000	250,000	261,000
Revenue From Other Agencies	122,100	101,407	103,537	105,289	107,164
Other Revenues	12,600	12,600	12,600	12,600	12,600
Transfers From Special Funds					
Revenue Sharing - General	508,693	594,000	594,000	262,000	-
Sewer Line Maintenance	222,943	247,000	254,400	262,000	270,000
Total	2,766,436	2,717,107	2,799,637	2,521,989	2,313,864

In the case of Monterey, California's revenue forecast, integrity of the budget format was maintained throughout the development of both Group I and Group II data forecasts. Thus, presentation in the City's budget format was not a problem. Monterey, California's general fund revenue forecast for fiscal years 1981-1985 is provided herein as Table IV-9.

G. SUMMARY

With the exception of developing and testing the econometric equations, the authors feel that the various steps involved in the overall process for developing a multi-year revenue forecast are relatively simple and straightforward. Care must be taken early-on in the process to insure a thorough understanding of the formulae which generate revenue. Limiting the selection of economic indicators to be used as independent variables in the development of econometric equations to those for which reliable projections can be obtained is <u>essential</u> in developing an effective and credible econometric model. Recognizing the advantages of presenting the overall revenue forecast in the budget format, integrity of the budget format should be maintained throughout the forecast development process. This will virtually eliminate any problems in the final step of consolidating the Group I and Group II data forecasts.

While a multi-year revenue forecast provides valuable information, its full worth cannot be realized unless it is used in conjunction with its counterpart - the multi-year

TABLE IV-9

MULTI-YEAR REVENUE FORECAST
CITY OF MONTEREY, CALIFORNIA

Revenue Category	1980-81	1981-82	1982-83	1983-84	1984-85
Taxes	6,270,800	7,049,600	7,867,000	8,540,400	9,352,200
Licenses and Permits	88,100	102,500	117,300	130,300	145,300
Fines, Forfeits, Penalties	260,100	260,000	260,000	260,000	260,000
Revenue from Use of Money and Property	1,608,000	1,467,000	1,537,000	1,580,000	1,621,000
Revenue From Other Agencies	1,052,300	1,073,107	1,116,737	1,149,589	1,213,664
Charges For Current Services	560,300	579,600	596,400	589,900	627,900
Other Revenue	12,600	12,600	12,600	12,600	12,600
Total General Fund	9,852,200	10,544,507	11,507,137	12,262,889	13,232,764
Transfers - Special Funds	2,182,636	2,657,100	3,053,400	3,207,300	3,412,700
Total Revenue	12,034,836	13,201,607	14,560,537	15,470,189	16,645,464

expenditure forecast. Chapter V presents a generalized approach for development of a multi-year expenditure forecast, together with a multi-year expenditure forecast for Monterey, California.

V. MULTI-YEAR EXPENDITURE FORECAST MODEL

A. NATURE OF THE MODEL

Essentially, the model described in this chapter takes a public employment approach to project expenditures. Aggregate spending forecasts follow from assumptions concerning the level of inputs which a municipal government will employ and the prices paid for these factors. That is, costs are associated with numbers of employees and the materials, supplies, and equipment which these employees use. In this context, the model will only be as accurate as the projected numbers of employees during the forecast period. In constructing the model this way, the results obtained from the analysis are easy to understand and modify if conditions change. Settlement packages for bargaining units, new service levels, or new programmatic functions can be readily added to the projection. All that is needed are assumptions concerning the extent of change that will take place in terms of people employed.

Expenditure projections are made using a simple computational procedure. First, total spending in the base year (the most recent year) is classified by function or department/division. Next, base year spending for each department/division is categorized into two cost components: (a) personal services (including salaries, wages, and fringe benefits) and (b) materials, supplies, and equipment (MSE). With

this data available, future departmental expenditures can be forecast based on assumptions concerning the level of services to be provided. Two additional categories of costs incurred by municipal governments which are addressed in the model include: non-departmental MSE and capital outlays.

Figure V-1 graphically illustrates the stages involved in forecasting expenditures according to the model. Each of these areas is discussed in greater detail below, with specific examples provided based on data obtained from the City of Monterey, California. Tables V-1 and V-2 are provided as background information. Table V-1 shows the functional components used throughout the examples which follow. Table V-2 provides the base year (Fiscal Year 1979-80) data used in developing the multi-year expenditure forecast.

EXPENDITURE FORECAST MODEL

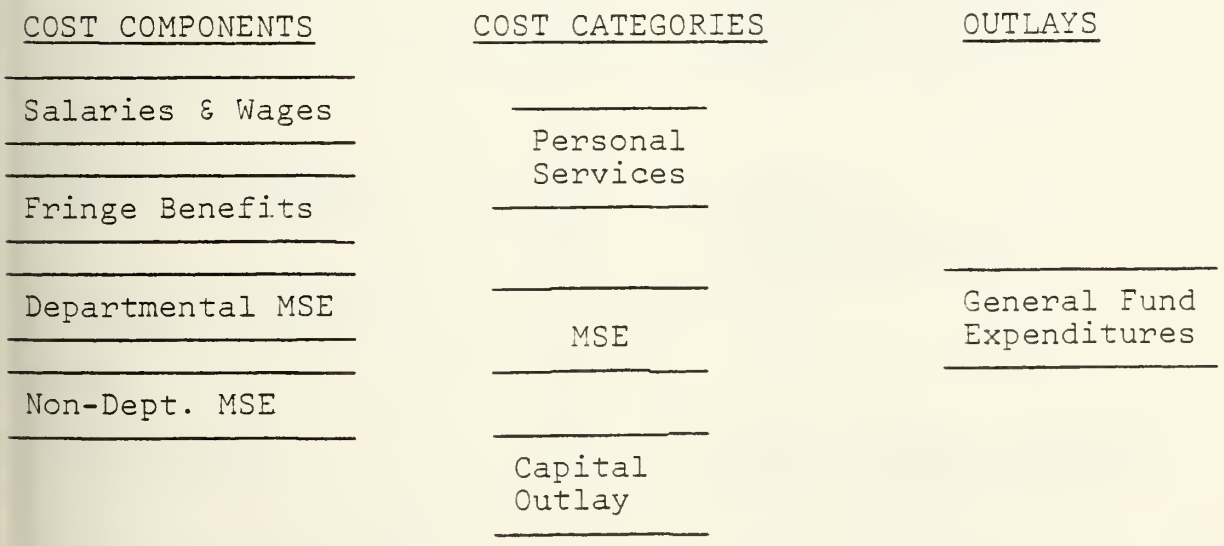

FIGURE V-1

TABLE V-1
GENERAL FUND EXPENDITURE FUNCTIONAL COMPONENTS
CITY OF MONTEREY, CALIFORNIA
(BASED ON 1980-81 BUDGET)

DEPARTMENT/ DIVISION	DEPT. NO.	COMPONENTS
CITY MANAGER	02	---
FINANCE	03	FINANCIAL ADMINISTRATION
	04	REVENUE
	05	ACCOUNTING
CITY CLERK	06	---
CITY ATTORNEY	07	---
PLANNING	09	PLANNING
	24	BUILDING INSPECTION
POLICE	22	---
FIRE	23	---
PUBLIC WORKS	25	P.W. ADMINISTRATION
	26	ENGINEERING
	27	STREET MAINTENANCE
	28	TUNNEL MAINTENANCE
	29	STORM DRAIN MAINT.
	30	SANITARY SEWER MAINT.
	31	HARBOR
	32	BUILDING MAINTENANCE
LIBRARY	34	---
PARKS & RECREATION	35	PARKS
	36	RECREATION
	37	ADMINISTRATION
CONFERENCE CENTER	38	---
MUSEUM	39	---
MISCELLANEOUS	17	MISC. & FIXED EXPENSE
	01	MAYOR-COUNCIL
CAPITAL IMPROVEMENT	18	---

TABLE V-2
GENERAL FUND EXPENDITURES
1979-1980
CITY OF MONTEREY, CALIFORNIA

DEPARTMENT/ DIVISION	SALARIES	MATERIALS/ SUPPLIES	EQUIPMENT OUTLAY	CAPITAL IMPRVMNT.	FRINGE BENEFITS	TOTAL
CITY MANAGER	$ 148,264	$ 63,305	$ 6,760	$ ---	$ ---	$ 218,329
FINANCE	164,229	45,581	1,333	---	---	211,143
CITY CLERK	32,495	39,144	916	---	---	72,555
ATTORNEY	70,447	9,994	4,405	---	---	84,846
PLANNING	258,888	204,386	6,676	---	---	469,950
POLICE	1,311,384	202,953	45,156	---	---	1,559,493
FIRE	1,049,278	120,512	28,181	---	---	1,197,971
PUBLIC WORKS	708,909	620,144	111,098	---	---	1,440,151
LIBRARY	283,608	133,960	5,889	---	---	423,457
PARKS & REC.	504,599	217,451	12,373	---	---	734,423
CONF. CENTER	173,758	360,048	10,954	---	---	544,760
MUSEUM	21,094	1,100	672	---	---	22,866
MISCELLANEOUS	---	425,305	---	---	1,301,194	1,726,499
CAPITAL IMPRVMT.	---	---	---	701,009		701,009
TOTAL	$4,726,953	$2,443,883	$234,413	$701,009	$1,301,194	$9,407,452

B. PERSONAL SERVICES

An accurate count of employees is critical in estimating costs. Municipal employees should be grouped by department/division and then further divided into relatively homogenous job classifications. Exactly how this is done will depend upon the local situation; however, one approach is to group employees by recognized bargaining units. In the City of Monterey, such units include management, general employees, police employees, and fire employees. Base year employee classification for the City of Monterey is shown in the first two columns of Table V-3.

The next step is to calculate an average wage for each job classification within each department/division. In the City of Monterey, cost of living increases are applied to total compensation (salaries/wages plus fringe benefits). Therefore, base year average total compensation (ATC) must be calculated to determine projected personal service costs. The basic equations used to compute the figures contained in Table V-3 are as follows:

$$\text{Ave. Benefit (AB)} = \frac{\text{Total Fringe Benefits (Table V-2)}}{\text{Total Base Year Employees}} \qquad \text{(Equation 1)}$$

$$\text{Ave. Salary (AS)} = \frac{\text{Total Salaries}}{\text{No. of Employees}} \qquad \text{(Equation 2)}$$

$$\text{ATC} = \text{AB} + \text{AS} \qquad \text{(Equation 3)}$$

TABLE V-3
SURVEY OF EMPLOYEES
1979-1980
CITY OF MONTEREY, CALIFORNIA

CLASSIFICATION BY DEPARTMENT	EMPLOYEES	TOTAL SALARIES	AVERAGE SALARY	AVERAGE BENEFIT	AVERAGE TOTAL COMP.
CITY MANAGER					
MANAGEMENT	5	$ 127,608	$25,522	$ 5,467	$ 30,989
GEN. EMPLOYEES	1	20,656	20,656	5,467	26,123
FINANCE					
MANAGEMENT	3	83,040	27,680	5,467	33,147
GEN. EMPLOYEES	7	81,189	11,598	5,467	17,065
CITY CLERK					
MANAGEMENT	1	17,028	17,028	5,467	22,495
GEN. EMPLOYEES	1	15,467	15,467	5,467	20,934
ATTORNEY					
MANAGEMENT	2	56,268	28,134	5,467	33,601
GEN. EMPLOYEES	1	14,179	14,179	5,467	19,646
PLANNING					
MANAGEMENT	5	133,176	26,635	5,467	32,102
GEN. EMPLOYEES	7	125,712	17,959	5,467	23,426
POLICE					
MANAGEMENT	7	194,676	27,811	5,467	33,278
POLICE EMPLOYEES	53	1,116,708	21,070	5,467	26,537
FIRE					
MANAGEMENT	6	165,180	27,530	5,467	32,997
FIRE EMPLOYEES	44	884,098	20,093	5,467	25,560

TABLE V-3 CONTINUED

CLASSIFICATION BY DEPARTMENT	EMPLOYEES	TOTAL SALARIES	AVERAGE SALARY	AVERAGE BENEFIT	AVERAGE TOTAL COMP.
PUBLIC WORKS					
MANAGEMENT	5	$ 128,208	$ 25,642	$ 5,467	$ 31,109
GEN. EMPLOYEES	33	580,701	17,597	5,467	23,064
LIBRARY					
MANAGEMENT	2	48,324	24,162	5,467	29,629
GEN. EMPLOYEES	15	235,284	15,686	5,467	21,153
PARKS & RECREATION					
MANAGEMENT	4	92,472	23,118	5,467	28,585
GEN. EMPLOYEES	24	412,127	17,172	5,467	22,639
CONFERENCE CENTER					
MANAGEMENT	3	75,372	25,124	5,467	30,591
GEN. EMPLOYEES	8	98,386	12,298	5,467	17,765
MUSEUM					
GEN. EMPLOYEE	1	21,094	21,094	5,467	26,561
	238	$4,726,953			

Having calculated average total compensation, total personal service (TPS) cost can then be estimated based on two assumptions: (1) the projected number of employees needed to maintain desired service levels, and (2) a cost of living inflator factor (P1). Therefore, the estimating equation becomes:

$$TPS = \text{Projected Employees} \times ATC \times P1 \qquad \text{(Equation 4)}$$

Five-year total personal service projections for the City of Monterey are shown in Table V-4. Employee projections are based on Fiscal Year 1980-81 budgeted positions and are assumed to remain constant during the forecast period, thus implying that current service levels will remain unchanged in the future. The inflator factor for management employees equates to projected increases in the CPI as discussed in Chapter IV. Inflator factors for the remaining job classifications were determined by applying the above CPI estimates to current labor-management agreements as shown in Figure V-2.

C. MATERIALS, SUPPLIES, AND EQUIPMENT (MSE)

The model assumes that growth in inputs for materials, supplies, and equipment will parallel the growth in public labor employment in each department. As a first step then, base year MSE cost per employee must be determined by dividing base year MSE costs by base year municipal employment, as shown in equation 5.

TABLE V-4
GENERAL FUND EXPENDITURE FORECAST
TOTAL PERSONAL SERVICES (TPS)
FISCAL YEARS 1980-1985
CITY OF MONTEREY, CALIFORNIA

CLASSIFICATION BY DEPARTMENT	EMPLS 80-85	1980-81 PI	1980-81 TPS($'s)	1981-82 PI	1981-82 TPS($'s)	1982-83 PI	1982-83 TPS($'s)	1983-84 PI	1983-84 TPS($'s)	1984-85 PI	1984-85 TPS($'s)
CITY MANAGER											
MANAGEMENT	6	12.3	208,804	11.2	232,190	9.3	253,784	7.0	271,549	7.0	290,557
GEN. EMPLOYEES	1	10.5	28,866	9.5	31,608	8.5	34,295	7.5	36,867	7.5	39,632
FINANCE											
MANAGEMENT	3	12.3	111,672	11.2	124,179	9.3	135,728	7.0	145,229	7.0	155,395
GEN. EMPLOYEES	8	10.5	150,855	9.5	165,186	8.5	179,227	7.5	192,669	7.5	207,119
CITY CLERK											
MANAGEMENT	1	12.3	25,262	11.2	28,091	9.3	30,703	7.0	32,852	7.0	35,152
GEN. EMPLOYEES	1	10.5	23,132	9.5	25,330	8.5	27,483	7.5	29,544	7.5	31,760
ATTORNEY											
MANAGEMENT	2	12.3	75,468	11.2	83,920	9.3	91,725	7.0	98,146	7.0	105,016
GEN. EMPLOYEES	1	10.5	21,709	9.5	23,771	8.5	25,792	7.5	27,726	7.5	29,805
PLANNING											
MANAGEMENT	5	12.3	180,253	11.2	200,441	9.3	219,082	7.0	234,418	7.0	250,827
GEN. EMPLOYEES	8	10.5	207,086	9.5	226,759	8.5	246,034	7.5	264,487	7.5	284,324
POLICE											
MANAGEMENT	7	12.3	261,598	11.2	290,897	9.3	317,950	7.0	340,207	7.0	364,021
POLICE EMPLOYEES	54	15.0	1,647,948	10.0	1,812,743	8.5	1,966,826	8.5	2,134,006	8.5	2,315,397
FIRE											
MANAGEMENT	6	12.3	222,334	11.2	247,235	9.3	270,228	7.0	289,144	7.0	309,384
FIRE EMPLOYEES	44	15.0	1,293,336	10.0	1,422,670	8.5	1,543,597	8.5	1,674,803	8.5	1,817,161
PUBLIC WORKS											
MANAGEMENT	6	12.3	209,612	11.2	233,089	9.3	254,766	7.0	272,600	7.0	291,682
GEN. EMPLOYEES	35	10.5	892,000	9.5	976,740	8.5	1,059,763	7.5	1,139,245	7.5	1,224,688

TABLE V-4 CONTINUED

CLASSIFICATION BY DEPARTMENT	EMPLS 80-85	1980-81 P1	1980-81 TPS($'s)	1981-82 P1	1981-82 TPS($'s)	1982-83 P1	1982-83 TPS($'s)	1983-84 P1	1983-84 TPS($'s)	1984-85 P1	1984-85 TPS($'s)
LIBRARY											
MANAGEMENT	2	12.3	66,547	11.2	74,000	9.3	80,882	7.0	86,544	7.0	92,602
GEN. EMPLOYEES	15	10.5	350,611	9.5	383,919	8.5	416,552	7.5	447,793	7.5	481,377
PARKS & REC.											
MANAGEMENT	4	12.3	128,404	11.2	142,785	9.3	156,064	7.0	166,988	7.0	178,677
GEN. EMPLOYEES	23	10.5	575,370	9.5	630,030	8.5	683,583	7.5	734,852	7.5	789,966
CONF. CENTER											
MANAGEMENT	3	12.3	103,061	11.2	114,604	9.3	125,262	7.0	134,030	7.0	143,412
GEN. EMPLOYEES	9	10.5	176,673	9.5	193,457	8.5	209,901	7.5	225,644	7.5	242,567
MUSEUM											
GEN. EMPLOYEE	1	10.5	29,350	9.5	32,138	8.5	34,870	7.5	37,485	7.5	40,296
TOTAL	245		6,989,951		7,695,782		8,364,097		9,016,828		9,720,817

TOTAL COMPENSATION INFLATOR FACTORS
CITY OF MONTEREY, CALIFORNIA

IF CPI REACHES	BUT IS LESS THAN	POLICE/FIRE EMPLOYEES TOTAL COMP. INCREASE
0%	5%	4%
5	7	6
7	10	8.5
10	12	10
12	14	12
14	16	14
16 or more		15

IF CPI REACHES	BUT IS LESS THAN	GENERAL EMPLOYEES TOTAL COMP. INCREASE
0%	6%	6.5%
6	9	7.5
9	11	8.5
11	13	9.5
13 or more		10.5

FIGURE V-2

$$\text{Dept. MSE Cost/Employee} = \frac{\text{Base Year Dept. MSE Cost}}{\text{Base Year Dept. Employees}} \qquad \text{(Equation 5)}$$

Non-departmental MSE costs should be grouped in a miscellaneous category and divided by total base year municipal employment. Table V-5 shows base year MSE cost per employee in the City of Monterey, determined by applying base year data contained in Tables V-2 and V-3 to equation 5.

This data combined with assumed changes in the level of employment facilitates simple, straightforward MSE projections once an appropriate inflator factor (P2) has been determined. The basic estimating equation can be expressed as follows:

$$\text{Projected MSE Cost} = \text{Projected Employees} \times \text{Base Year MSE Cost/Employee} \times P2 \qquad \text{(Equation 6)}$$

While there are several price indices which could be used to inflate MSE costs, the index used in the City of Monterey example and referred to in Chapter II is the Implicit Price Deflator for State and Local Government Goods and Services. The actual inflator factor (P2) used in Table V-5 to project MSE cost was calculated as shown in Figure V-3.

D. CAPITAL OUTLAYS

Capital expenditures are difficult to forecast because of their discretionary nature. However, it may be possible to use the prospective capital expenditures as reported in the municipal government's capital budget. If applicable, debt service resulting from these projects should be added

TABLE V-5
GENERAL FUND EXPENDITURE FORECAST
MATERIALS, SUPPLIES, AND EQUIPMENT (MSE)
FISCAL YEARS 1980-1985
CITY OF MONTEREY, CALIFORNIA

DEPARTMENT/ DIVISION	79-80 MSE/ EMPL.	EMPLS 80-85	1980-81 P-2	1980-81 MSE($'s)	1981-82 P-2	1981-82 MSE($'s)	1982-83 P-2	1982-83 MSE($'s)	1983-84 P-2	1983-84 MSE($'s)	1984-85 P-2	1984-85 MSE($'s)
CITY MANAGER	$11,678	7	8.5	88,694	8.5	96,233	8.5	104,413	8.5	113,288	8.5	122,917
FINANCE	4,691	11	8.5	55,987	8.5	60,746	8.5	65,909	8.5	71,511	8.5	77,589
CITY CLERK	20,030	2	8.5	43,465	8.5	47,160	8.5	51,169	8.5	55,518	8.5	60,237
ATTORNEY	4,800	3	8.5	15,624	8.5	16,952	8.5	18,393	8.5	19,956	8.5	21,652
PLANNING	17,589	13	8.5	248,093	8.5	269,181	8.5	292,061	8.5	316,886	8.5	343,821
POLICE	4,135	61	8.5	273,675	8.5	296,937	8.5	322,177	8.5	349,562	8.5	379,275
FIRE	2,974	50	8.5	161,340	8.5	175,054	8.5	189,934	8.5	206,078	8.5	223,595
PUBLIC WORKS	19,243	41	8.5	856,025	8.5	928,787	8.5	1,007,734	8.5	1,093,391	8.5	1,186,329
LIBRARY	8,226	17	8.5	151,729	8.5	164,626	8.5	178,619	8.5	193,802	8.5	210,275
PARKS & REC.	8,208	27	8.5	240,453	8.5	260,892	8.5	283,068	8.5	307,129	8.5	333,235
CONF. CENTER	33,727	12	8.5	439,126	8.5	476,452	8.5	516,950	8.5	560,891	8.5	608,567
MUSEUM	1,772	1	8.5	1,923	8.5	2,086	8.5	2,263	8.5	2,455	8.5	2,664
SUBTOTAL		245		2,576,134		2,795,106		3,032,690		3,290,467		3,570,156
MISC.	1,787	245	8.5	475,029	8.5	515,406	8.5	559,216	8.5	606,749	8.5	658,323
TOTAL		245		3,051,163		3,310,512		3,591,906		3,897,216		4,228,479

IMPLICIT PRICE DEFLATOR
STATE & LOCAL GOVERNMENT GOODS & SERVICES
(1972=100)

YEAR	INDEX	% INCREASE
1972	100.0	---
1973	107.3	7.3
1974	118.4	10.3
1975	129.7	9.5
1976	138.8	7.0
1977	150.0	8.1
1978	162.1	8.1
1979	177.1	9.3
1980	192.4	8.6
	TOTAL	67.9

Average Increase = 67.9/8 = 8.5%

Source: Survey of Current Business, July 1979 issue, published by the U.S. Department of Commerce, Bureau of Economic Analysis.

FIGURE V-3

to the forecast as they are expected to occur. In addition, operating costs should be projected as the projects are completed.

In the City of Monterey, the Citizens Tax Committee recommended, approximately five years ago, that 10% of the City's General Fund budget be set aside for the Capital Improvement Program. Their recommendation was based, in part, on the realization that a considerably lesser amount had been devoted for this essential purpose in previous years. This 10% recommendation has since been interpreted as a "minimum" amount which should be devoted to the purpose of providing public facilities. With this in mind, the Capital Improvement figures shown in Table V-6 represent actual budgeted amounts for 1980-81 and 10% of General Fund expenditures for 1981-85.

E. SUMMARY

Table V-6 combines total personal service (TPS) projections (Table V-4) and materials, supplies, and equipment (MSE) projections (Table V-5) with capital improvement estimates to forecast total General Fund expenditures for the City of Monterey.

As discussed in Chapter II, there can be a number of methods used to forecast expenditures. The authors' approach is to make forecasting simple. In fact, all of the steps which are necessary in carrying out the analysis can be labeled either:

TABLE V-6
GENERAL FUND EXPENDITURE FORECAST
FISCAL YEARS 1980-1985
CITY OF MONTEREY, CALIFORNIA

DEPARTMENT/ DIVISION	1980-81	1981-82	1982-83	1983-84	1984-85
CITY MANAGER	$ 326,364	$ 360,031	$ 392,492	$ 421,704	$ 453,106
FINANCE	318,514	350,111	380,864	409,409	440,103
CITY CLERK	91,859	100,581	109,355	117,914	127,149
ATTORNEY	112,801	124,643	135,910	145,828	156,473
PLANNING	635,432	696,381	757,177	815,791	878,972
POLICE	2,183,221	2,400,577	2,606,953	2,823,775	3,058,693
FIRE	1,677,010	1,844,959	2,003,759	2,170,025	2,350,140
PUBLIC WORKS	1,957,637	2,138,616	2,322,263	2,505,236	2,702,699
LIBRARY	568,887	622,545	676,053	728,139	784,254
PARKS & REC.	944,227	1,033,707	1,122,715	1,208,969	1,301,878
CONF. CENTER	718,860	784,513	852,113	920,565	994,546
MUSEUM	31,273	34,224	37,133	39,940	42,960
MISCELLANEOUS	475,029	515,406	559,216	606,749	658,323
SUBTOTAL	$10,041,114	$11,006,294	$11,956,003	$12,914,044	$13,949,296
CAPITAL IMPRVMT.	4,137,364	1,100,629	1,195,600	1,291,404	1,394,930
TOTAL	$14,178,478	$12,106,923	$13,151,603	$14,205,448	$15,344,226

- Identifying
- Categorizing
- Organizing
- Simple Arithmetic Computations

While expenditure forecasts can be obtained via full-scale statistical techniques, or trend analysis, the technique discussed in this chapter is more accurately termed a deterministic or accounting identity approach. The general approach relies on varying degrees of categorization according to type of spending (e.g., Personal Services, MSE, etc.). The expenditure categories are then projected according to a consistent set of assumptions concerning service/public employment levels and price level changes.

Other considerations necessary to complete the development of a multi-year revenue and expenditure forecasting process are presented in Chapter VI which includes considerations regarding the presentation of forecast results, forecasting and the budget process, and routine updating of the revenue and expenditure forecasting model.

VI. OTHER CONSIDERATIONS

Authorities in the field of municipal finance agree that effective implementation and use of a forecasting process require that consideration be given to the interrelationship between the forecasting and budget formulation processes [Ref. 55]. Further, the authors feel that the generalized approach for developing the forecasting model as presented in Chapters IV and V would be incomplete without a discussion of forecast presentation and a method for periodically updating the model. This chapter, therefore, presents other considerations regarding multi-year revenue and expenditure forecasting as follows:

- Presentation of results.
- Updating the model.
- Interrelationship between forecasting and budgeting.

A. PRESENTATION OF RESULTS

While it is possible simply to present, without comment, the projected revenues and expenditures, the authors feel that this is not likely to be an effective method of presentation. This is because public officials and the general public must be made to understand that the forecasts are based on a given set of assumptions, and that unforeseen changes regarding the future state of the local economy and revenue structure will affect the resulting forecast. Likewise, it must be stressed that the expenditure projections

have also been made under a particular set of assumptions concerning future price and wage changes and service levels. Failure to clearly identify such assumptions could lead to widespread loss of credibility.

The method of presentation is especially important when revenue shortfalls (gaps) are being forecast. These budget gaps should be presented in a manner that clearly indicates the net expenditure reductions needed each year to balance the budget [Ref 56]. Such a presentation form, taken from the City of Portland, is presented in Figure VI-1.

EXPENDITURE REDUCTIONS NECESSARY TO
BALANCE THE GENERAL FUND BUDGET
($000's)

FISCAL YEAR	1979-80	1980-81	1981-82	1982-83	1983-84	TOTAL EFFECT
1979-80	[$ 5,849]	$ 6,321	$ 6,845	$ 7,419	$ 8,055	$34,489
1980-81		[1,920]	2,078	2,252	2,444	8,694
1981-82			[1,674]	1,813	1,967	5,454
1982-83				[2,289]	2,485	4,774
1983-84					[2,867]	2,867
Additional Resources Needed	$ 5,849	$ 8,241	$10,597	$13,773	$17,818	$56,278

[ ] Reductions needed to balance the budget.

FIGURE VI-1

Another approach is to present the forecast graphically, while highlighting the effects of inflation on both revenues and expenditures. This approach was used by the authors in presenting the City of Monterey forecast as shown in Figures VI-2 through VI-5.

GENERAL FUND REVENUE AND EXPENDITURE FORECAST
CITY OF MONTEREY, CALIFORNIA
($000's)

	1980-81	1981-82	1982-83	1983-84	1984-85
REVENUE	$12,035	$13,202	$14,561	$15,470	$16,645
EXPENDITURE	14,178	12,107	13,152	14,205	15,344
SURPLUS/ (DEFICIT)	$(2,143)	$ 1,185	$ 1,409	$ 1,265	$ 1,301

FIGURE VI-2

Figure VI-3 graphically illustrates the results reported in Figure VI-2. Figures VI-4 and VI-5 portray the predicted effect of inflation on revenues and expenditures respectively during the forecast period. This is best accomplished by establishing the latest fiscal year for which there is actual data as the base year (i.e., CPI=100). By doing this the presentation method allows public officials to see at a glance how much of the projected growth in revenues and expenditures is due to the effects of inflation. It also demonstrates clearly the rate at which inflation is expected to increase during the forecast period.

While other formats may be used, the authors feel that the presentation must be straightforward and understandable,

REVENUE-EXPENDITURE GAP
CITY OF MONTEREY, CALIFORNIA

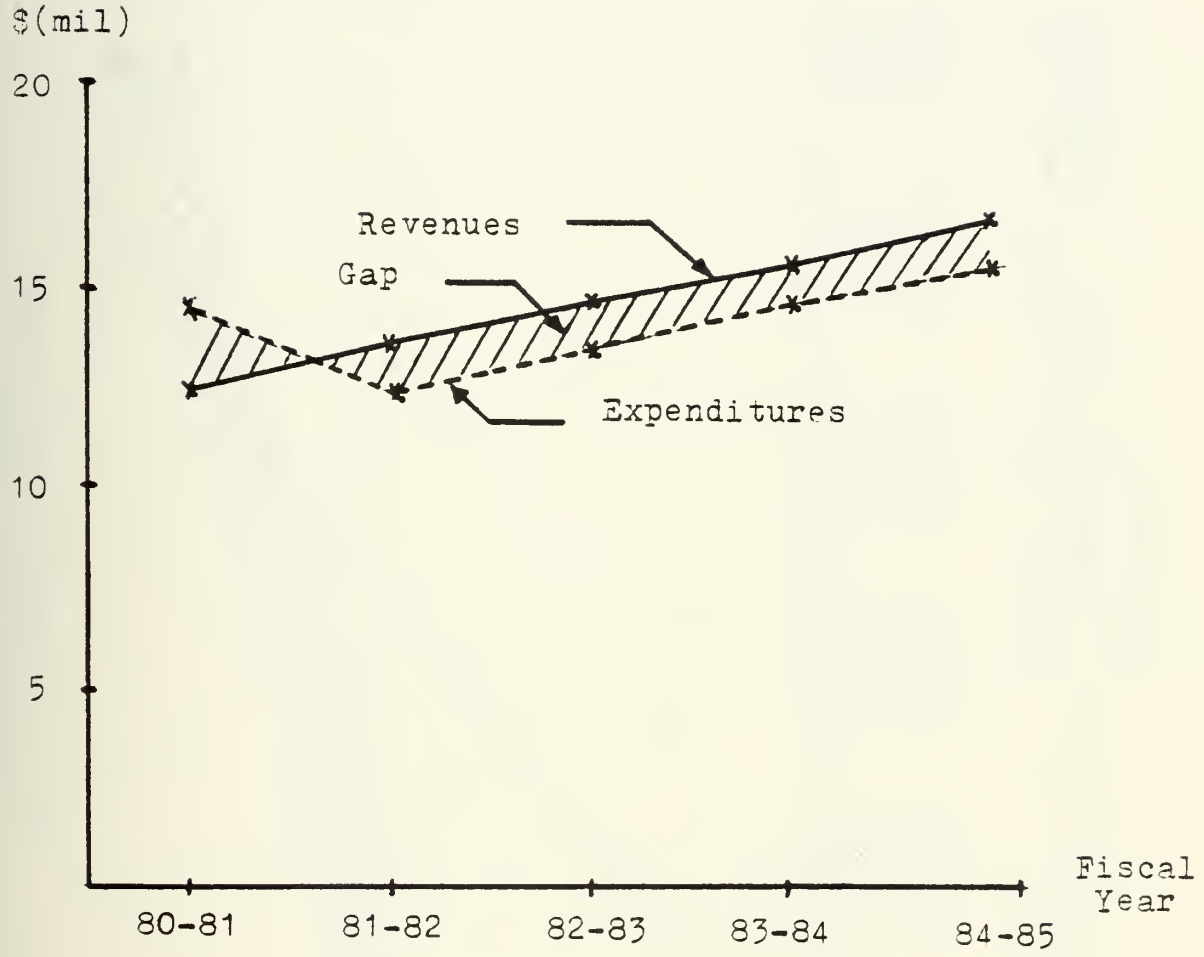

FIGURE VI-3

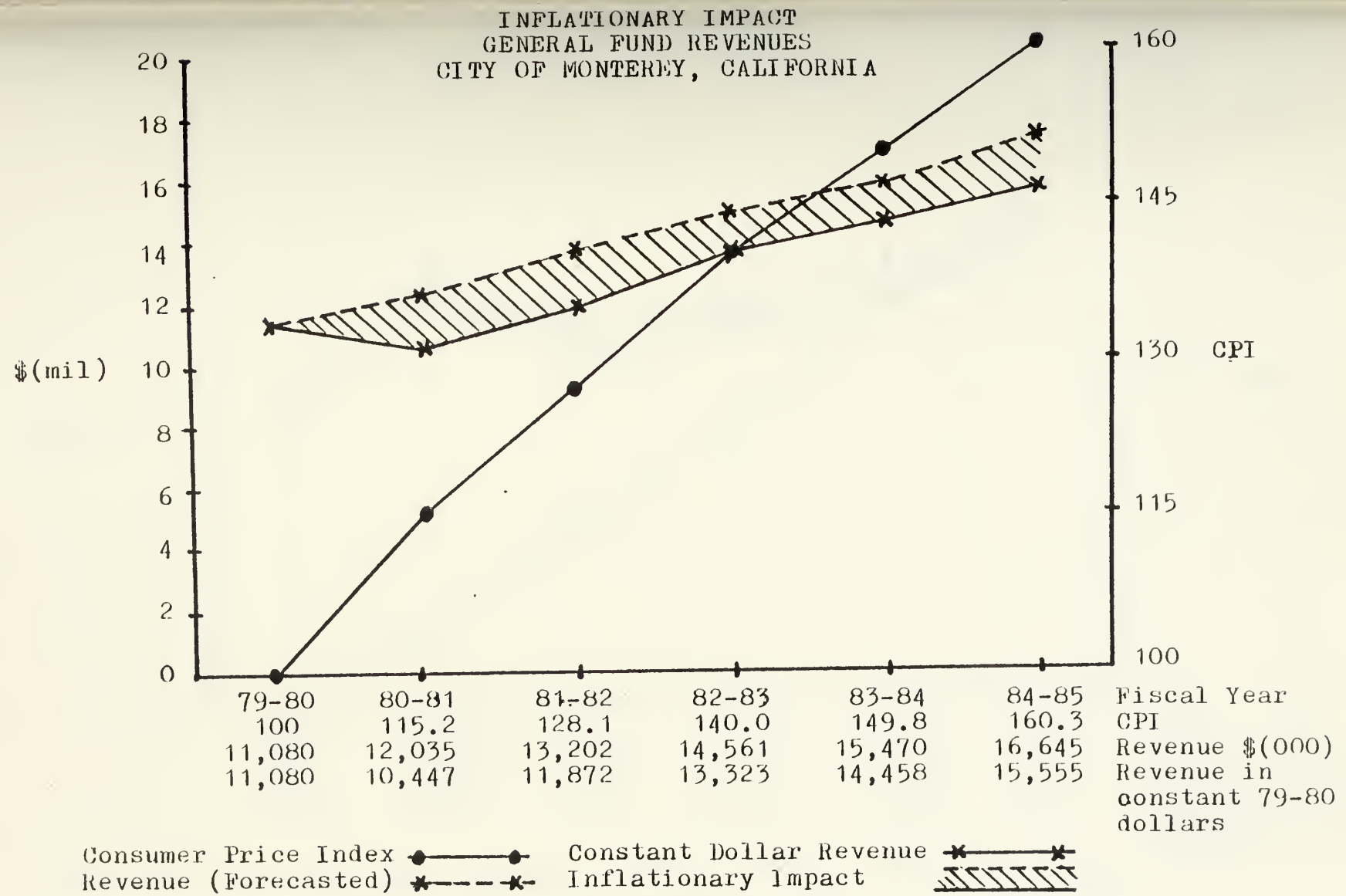
INFLATIONARY IMPACT
GENERAL FUND REVENUES
CITY OF MONTEREY, CALIFORNIA
$(mil)
20
18
16
14
12
10
8
6
4
2
0
160
145
130
CPI
115
100
79-80 80-81 81-82 82-83 83-84 84-85 Fiscal Year
100 115.2 128.1 140.0 149.8 160.3 CPI
11,080 12,035 13,202 14,561 15,470 16,645 Revenue $(000)
11,080 10,447 11,872 13,323 14,458 15,555 Revenue in constant 79-80 dollars
Consumer Price Index
Revenue (Forecasted)
Constant Dollar Revenue
Inflationary Impact

FIGURE VI-4

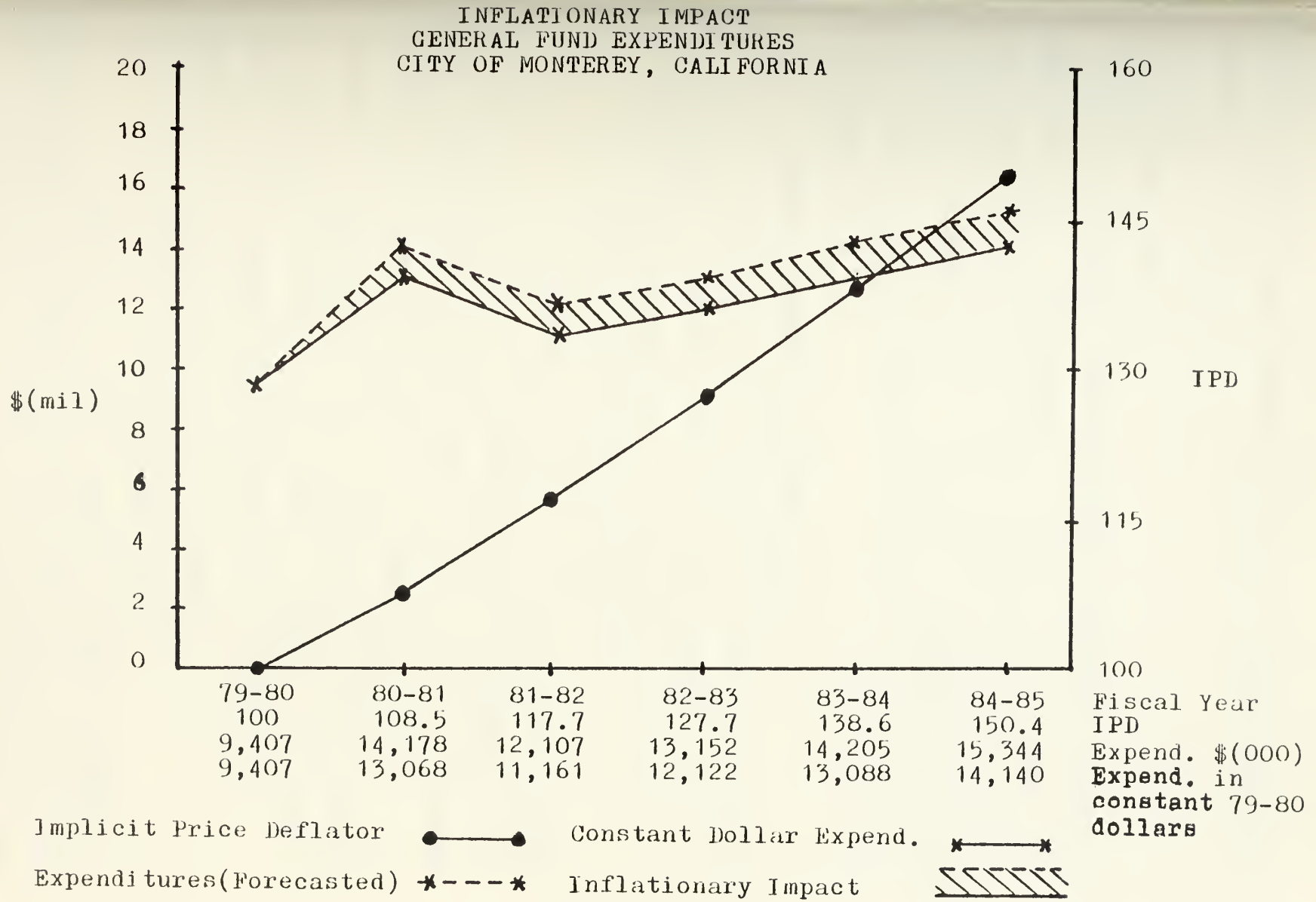
INFLATIONARY IMPACT
GENERAL FUND EXPENDITURES
CITY OF MONTEREY, CALIFORNIA
$(mil)
IPD
20
18
16
14
12
10
8
6
4
2
0
160
145
130
115
100
79-80 80-81 81-82 82-83 83-84 84-85 Fiscal Year
100 108.5 117.7 127.7 138.6 150.4 IPD
9,407 14,178 12,107 13,152 14,205 15,344 Expend. $(000)
9,407 13,068 11,161 12,122 13,088 14,140 Expend. in constant 79-80 dollars
Implicit Price Deflator
Constant Dollar Expend.
Expenditures(Forecasted)
Inflationary Impact

FIGURE VI-5

while highlighting projected surpluses/deficits and the effects of inflation.

B. UPDATING THE MODEL

Once the revenue and expenditure forecasting model has been developed, the historical data base is available for all future projections and only requires an annual updating for the past year's data. Suggested procedures for updating both the revenue and expenditure portions of the model are discussed below.

1. Revenue Forecasting Model Update

The procedure for updating the Group I and Group II Data forecasts requires repeating certain steps involved in the initial model development as outlined in Figure IV-1.

a. Group I Data Forecast Update.

To update this section of the revenue forecast, actual collections of all revenues used as dependent variables together with actual prior values of all independent variables must be added to the historical data base. The econometric equations, in turn, must then be revised based on the updated historical data base. Finally, new projections for the independent variables must be obtained to calculate an updated Group I Data forecast.

b. Group II Data Forecast Update.

The Group II data base must first be updated to include actual collections from the prior year. The assumptions and basis for projections used in developing the last forecast must then be modified, giving consideration not only

to the updated data base but also to changes in the tax base and tax rate if applicable. Again, the modified assumptions concerning the causal variables must be documented, and incorporated into the revenue formulae to calculate the updated Group II Data forecast.

Analysis of the expanding historical data base may warrant reevaluation of the forecasting techniques originally selected. As more historical information becomes available, emerging trends or previously unidentified economic relationships may become apparent. Thus, in the interest of forecasting accuracy, consideration should be given to reclassification of revenue sources by forecasting technique as appropriate.

2. Expenditure Forecasting Model Update

The expenditure projections resulting from the model presented in Chapter V are based on actual expenditure and public employment data for the past fiscal year. Therefore, the steps involved in updating the expenditure model are quite similar to the steps involved in developing the model.

a. Recalculate average TPS and MSE costs per public employee based on actual data for the past fiscal year.

b. Revise public employment projections based on anticipated service levels during the forecast period.

c. Revise TPS and MSE inflator factors as necessary.

d. Using the revised information above, calculate TPS and MSE costs for each year of the forecast period.

e Review the City's capital budget to project capital outlays.

f. Forecast aggregate municipal expenditures by summing projected TPS cost, MSE cost, and capital outlays.

C. FORECASTING AND THE BUDGET PROCESS

The budget formulation and multi-year revenue and expenditure forecasting processes both deal with projections of future revenues and expenditures. While the budget formulation process results in an approved financial plan for the next fiscal year, the multi-year revenue and expenditure forecast provides the intermediate-term perspective necessary for gap and impact analysis. Recognizing the interrelationship between the forecasting and budget formulation processes, the literature indicates that careful consideration must be given to the organizational framework within which the two processes will function, as well as the timetable for developing the multi-year forecast and the annual budget.

1. Organizational Framework

The placement of the forecasting process under the purview of those responsible for preparing the budget makes maximum use of local financial management expertise [Ref. 57]. This is most evident on the expenditure side since the same individuals responsible for overseeing the administration of the current budget and preparing the subsequent document are likely to have the most intimate knowledge of expenditure plans of individual department heads.

For revenue forecasting purposes, the budgeting group should include at least one person with a background in economics so that the revenue equations will reflect a recognition of the influence the local economy will have on revenues. It is preferable that this individual also be familiar with statistics, especially if econometric techniques, such as those presented in Chapter IV, are to be used in the forecasting process. In addition, sufficient staff support is necessary if the forecasts are to be produced on time and with quality. This is particularly important if the methods used are not computer-oriented.

2. Forecast Timetable

The annual budget process is a time-consuming effort. Thus, if the multi-year forecast is to be accomplished concurrently, the staff may be overwhelmed by the responsibility for producing two documents during a short period of time. This problem can be resolved by preparing a forecast in advance of the budget cycle for internal management purposes, and then publishing an updated version of the forecast along with the proposed budget.

Regarding preparation of the updated forecast, Chang recommends that the starting date be the first day of the seventh month of the present fiscal year. This will give forecasters enough time to complete the forecasts before the required date for the submission of the budget proposal and late enough to collect reliable future values of variables that are needed in making the forecasts [Ref. 58].

D. SUMMARY

This concludes the discussion of multi-year revenue and expenditure forecasting as it relates to small municipal governments. Chapter VII provides a summary, a brief discussion of major conclusions resulting from this citation, and an outline of areas for future study.

VII. SUMMARY AND CONCLUSIONS

A. SUMMARY

Initially, the reader was introduced to the subject of multi-year revenue and expenditure forecasting. It was pointed out that authorities in the field of municipal government are concerned that multi-year revenue and expenditure forecasting is not being employed by small municipal governments although the need exists. The authors evaluated the existing revenue and expenditure forecasting process of Monterey, California by conducting a management audit. The authors concluded that a multi-year forecasting capability would greatly improve the City's overall budget formulation and decision-making processes and provided specific recommendations for improvement.

A multi-year revenue and expenditure forecasting model for the City of Monterey, California was developed by the authors. The approach used in its development was presented in a generalized format to serve as a guide for other small municipal governments in developing their own forecasting models. Additional considerations regarding forecast presentation, forecasting and the budget process, and model updating were also discussed, together with suggested approaches.

Motivation for this thesis stemmed from the genuine concern of local authorites in the field of municipal

government regarding the many economic uncertainties which threaten the future financial stability of small municipal governments. The insights and concerns provided by those actually involved in municipal finance provided the authors with a better understanding of the need for and the benefits to be derived from multi-year revenue and expenditure forecasting. The data presented is the best possible correlation of the authors' collective professional backgrounds, experience, and opinions with those who have volunteered their knowledge and insight.

The need for multi-year revenue and expenditure forecasting at the municipal level will continue as long as the prevailing conditions of economic uncertainty persist. Thus, the ability of local governments to analyze the impact of current decisions on future revenues and expenditures is vital to their survivability. To aid in making the need a reality, local governments must be afforded a basic understanding of the potential uses of a multi-year forecasting system, together with a framework within which a forecasting system can be developed for their specific application.

The concluding paragraphs will summarize the general conclusions of the authors and outline those areas considered appropriate for future study.

B. CONCLUSIONS

1. Few local governments take a systematic approach to projecting revenues and expenditures beyond the budget year. Recent trends indicate that current expenditures are rising

faster than current revenues. Since this condition is expected to continue throughout the foreseeable future, a growing number of cities can be expected to experience severe fiscal stress in the coming decade.

2. Although few local governments systematically prepare multi-year forecasts, current revenue and expenditure forecasting theory offers several approaches with varying levels of sophistication. The four basic approaches include: (1) expert judgment, (2) trend analysis, (3) deterministic techniques, and (4) statistical analysis (econometrics).

3. The primary uses of multi-year revenue and expenditure forecasting include both impact and gap analysis. These analytical techniques provide insight into the impact of current decisions on future revenues and expenditures and potential revenue-expenditure imbalance.

4. The management audit of Monterey, California confirmed the need for and potential benefits of multi-year revenue and expenditure forecasting. While the existing one-year forecasting process was considered basically sound, considerable improvements could be made in the overall planning, budgeting, and financial decision-making processes by adoption of a multi-year forecasting process. Thus, municipalities should consider accomplishment of a management audit to ensure that existing deficiencies and areas with potential for improvement are identified prior to developing a multi-year forecasting process.

5. Development of a multi-year revenue and expenditure forecasting process is not beyond the capability of small municipalities. The generalized approach as outlined in Chapters IV, V, and VI provides the framework within which a multi-year forecasting model can be developed with little or no outside assistance required.

C. AREAS FOR FUTURE STUDY

1. Historical Data

One of the major and time-consuming problems faced by the authors involved the collection of historical data pertaining to the independent variables used in developing the econometric equations. The availability of an annually published source of historical data regarding county and local economic indicators (i.e., population, personal income, etc.) would greatly reduce the time required to develop a forecasting model.

2. Future Projections of Economic Indicators

The credibility of a forecast ultimately depends on the accuracy of the assumptions and projected causal variables upon which the forecast is based. A need exists for reliable projections of economic conditions which can be used as a basis for multi-year forecasting at the municipal level. This is considered an area which should be pursued at the state and/or county levels.

3. Technical Expertise

While recognizing that small municipalities may lack the personnel and computer hardware needed for application

of econometric techniques, this problem could be minimized by developing centralized sources for the technical and hardware services, or as a minimum, by identifying external sources where these services can be obtained.

4. Computer Application

Since the revenue and expenditure model deals with data routinely captured by the local accounting system, the efficiency of the forecasting process would be greatly enhanced by linking it to the accounting system via the computer. Thus, development of computer software to provide this link would greatly reduce the time and effort required to update the forecast.

In accordance with its initial objective, this thesis has reviewed current literature in the area of fiscal forecasting in the public sector, has developed a forecasting model for the City of Monterey, California, and has presented a generalized approach for development of a multi-year revenue and expenditure forecasting process for general application by small municipal governments.

APPENDIX A

SOURCES OF PREFERRED PRACTICES

1. Bahl, Roy and Montrone, William, Forecasting Municipal Revenues and Expenditures: A Primer and Handbook, Coalition of Northeast Municipalities, January 1980.

2. Burchell, and Listokin, The Fiscal Impact Handbook, Center for Urban Policy Research, New Brunswick, New Jersey, 1978.

3. County of San Diego, Six Year Financial Projections, 1979.

4. Dior Marrero, Multi-Year Financial Projections, City of Ventura, CA, 1980-85, December 1979.

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6. Financial Management Department, City of San Diego, Six-Year Revenue and Expenditure Forecasts, 1979-1984.

7. Herbert, Leo, Auditing the Performance of Management, Wadsworth, Inc., 1979.

8. Pomeranz, F., Cancellieri, A., Stevens, J., and Savage, J., Auditing in the Public Sector, Coopers and Lybrand, 1976.

9. Ralph Anderson and Associates, A Practical Approach to Forecasting the Availability of General Fund Revenue in Beverly Hills, 1974-75.

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APPENDIX B

BUDGET MANAGEMENT QUESTIONNAIRE

1. Organization and Management

Budgeting is important to government because of the critical nature of services provided (for example: fire, police, and education); the complex economic environment; and the public's involvement through elected officials. An effective budgeting process cannot be instituted successfully, however, until the government entity recognizes the need to give budgeting a top place in the organizational structure. Because budgeting embraces all major elements of an organization, it must be directed by a chief executive with sufficient authority to get the job done effectively.

The budgeting function must have a defined organizational structure with appropriate lines of authority and an intelligent grouping of tasks. The structure should be documented with an organization chart and an operations manual.

Normally, the budgeting function is headed by a budget director or officer who reports directly to the chief executive. The size and complexity of the director's organization generally vary with the size of the government.

a. Executive Planning

(1) If the entity has an executive planning function, does it provide overall goals and objectives for use in the budgeting process?

(2) Does the executive planning group

(a) Have representation from the various organizational elements?

(b) Formulate and revise the long-range plans to accomplish organizational goals and objectives?

(c) Reconcile the organizational long and short-range plans with those of the individual departments?

b. Budget Organization

(3) Does the entity have an identifiable organizational function responsible for the overall budgeting process?

(4) If so, is this function

(a) Separate from the accounting function?

(b) Accountable to an appropriate management level, preferably the chief executive?

(c) Directed by a budget director or budget officer?

(d) Coordinated with the financial department?

(5) Has the budgeting group developed and implemented a formal budget procedures manual?

(6) Has the entity evaluated various budget approaches to determine the one that best meets its needs?

(7) Does the entity's organization provide for an objective review of the budget by an individual knowledgeable in applicable accounting principles?

2. Budget Formulation

Budget formulation is usually the responsibility of the chief executive -- through the budget officer -- and is

accomplished by the correlation of financial data and the projected requirements of the various functions and activities of the entity. During the preparation period, the budget director and the various organizational units continuously exchange information, proposals, and evaluations of budgetary requests.

The organizational units must prepare their estimates of revenue and/or expenditures early enough in the cycle to permit appropriate review and consolidation by the budget director. The budget preparation effort should be completed in sufficient time to enable the adoption of the budget before the beginning of the period covered.

a. Budget Calendar

(1) Is a budget calendar used?

(2) If so, does the calendar

(a) Detail the completion dates for each phase of the budgeting process?

(b) Identify the organizational units involved in each phase of the process?

(c) Permit time for management review at each organizational level?

(3) Is the calendar based on prior experience modified for anticipated events?

(4) Does the chief executive or budget officer monitor the budgeting process to ensure that each step is accomplished in a timely manner?

(5) Is the budget calendar flexible enough to permit consideration of unforeseen events, e.g., passage of emergency legislation?

b. Revenue Planning

Estimating revenue has as many facets as there are types of revenue. Normally, a government's major source of revenue is taxes. Estimates of tax revenue can generally by derived by applying the appropriate tax bases to the tax rates set by the legislative body. The auditor must ascertain, however, if the entity has considered the relevant determining factors -- increases in building activity, rises or declines in unemployment, economic development, new regulations, etc. -- in determining the tax bases.

Other revenue sources include licenses and permits, fines and penalties, intergovernmental grants, and shared revenue. The basis for estimating revenue from these sources varies with the type of revenue being considered.

(6) Are estimates of revenue developed before the budget is formulated?

(7) Does the entity have adequate procedures for identifying new sources of revenue?

(8) Are the revenue estimates supported by detailed analyses?

(9) Do revenue estimates give consideration to

(a) Actual revenues of prior years?

(b) Scheduled funding of grants?

(c) Reimbursement of funds expended?

(10) Are management's assumptions concerning significant increases or decreases in revenue realistic?

(11) Have those assumptions given consideration to

(a) New sources of revenue that will be effective in the new year?

(b) Changes in policy or conditions that may affect revenue items?

(c) Anticipated surplus carryovers from prior years?

(d) Anticipated deficit carryovers from prior years?

(e) Reliable estimates of delinquent revenue?

(f) Revenue programs scheduled to end during the budget period?

(g) The effect of pending legislation?

c. Expenditure Planning

Estimates of expenditures normally fall into two major categories: (1) those covering general expenses that are not the responsibility of any one department, such as interest maturing during the period on general obligation bonds; and (2) those covering operations of the various departments.

Departments prepare their expenditure estimates or budget appropriations in accordance with the governmental budget approach (i.e., traditional, program or performance). To ensure uniformity in the estimates, the budget officer

normally issues detailed instructions to the departments before the budget cycle begins.

(12) Have forms been developed for departments to use in preparing their expenditure estimates?

(13) Are these forms compatible with the entity's overall budget approach to facilitate consolidation of the estimates into the final budget?

(14) Are instructional packages sent to all departments in the initial stage of developing the expenditure budget?

(15) Do these instructional packages include

(a) The budget calendar?

(b) An executive statement concerning goals, policies, and expectations for the upcoming budget period?

(c) Instructions for completing the budget forms including comments on required documentation?

(d) Analysis of the previous year's activities?

(16) Do the executive policy statement and related policy documents included in the budget package provide

(a) A translation of broad goals and policies into detailed requirements for the various departments?

(b) Positive goals rather than negative ones?

(c) Measurement criteria?

(d) The general level of revenue and expenditures for the projected budget period?

(e) Estimates of expected cost reductions for the year by department?

(f) Organizational plans for new, improved, or expanded services?

(g) Notice of new administrative regulations and guidance in their application?

(h) Comments as to the impact of economic conditions on services and programs?

(17) Do the department budgets include goals and objectives in line with those in the chief executive's policy statements?

(18) Do the policy statements indicate how the goals and objectives should be measured?

(19) Does the department budget provide estimated performance results at various levels of funding as well as the department's final recommended budget?

(20) Are the department budget estimates broken out by organizational subunit, e.g., branch or division?

(21) Does the budget officer receive budgets from all departments and institutions over which the entity has jurisdiction?

(22) Are the budgets and supporting data received no later than the date designated in the budget calendar?

(23) Are the department submissions

(a) In conformance with the overall budget approach?

(b) Adequately supported?

(24) Does the chief executive use program specialists or consultants in the review of department requests?

(25) Is the chief executive's budget review staff of sufficient size to ensure effective review and appraisal of the department submissions?

(26) Does the budget review staff

(a) Correlate the budget requests with the short and long-range plans of the department and the governmental entity?

(b) Review the department assumptions to make certain that all factors (wage increases, for example) that influence the estimates are incorporated into the budget?

(c) Verify the adequacy and accuracy of the data submitted by the departments?

(d) Coordinate the review with each department to ensure that budget requests are fully understood and supported?

(e) Verify that department procurements and services are not duplicated by another department?

(27) In preparing the budget data for the chief executive's review, does the review staff

(a) Prepare or request additional information that will facilitate the chief executive's review?

(b) Prepare a comprehensive budget package including recommendations for action?

(c) Determine that the chief executive's policy statements have been recognized in the budget package?

(28) Are the major revisions proposed by the review staff approved by the chief executive?

(29) Does the budget officer and/or review staff assist the chief executive in

(a) Preparing the final budget document?

(b) Responding to legislative inquiries on the budget, including the development of additional support data where needed?

(30) Are the department budget requests consolidated into a budget summary for the chief executive's review?

(31) Is the summary and supportive data sufficient for the chief executive to prepare his recommendations to the legislative body?

(32) During his review of the expenditure budget, does the chief executive have an up-to-date estimate of revenue?

(33) Are the departments given an opportunity to support their requests through hearings or by providing additional data before the chief executive's revision of the budget?

(34) Does the chief executive refrain from making arbitrary adjustments to expenditure requests?

(35) Before reducing expenditure requests, does the chief executive evaluate the impact the reduction will have on services or in creating revenue, such as matching grant funds?

APPENDIX C

BUDGET MANAGEMENT QUESTIONNAIRE

ADDITIONAL QUESTIONS

1. What potential capital investment opportunities were passed up in recent years because of unavailablity of projected revenue and/or expenditure forecasts beyond the budget year?

2. How would a three year revenue and expenditure forecast enhance current decision making and budget formulation processes? Would current procedures for these processes be modified? If yes, what would the "flow" look like?

3. What "emergency" actions have been necessary to obtain additional funding during recent years?

4. Does the city include short/long range financing requirements in its' budget formulation process to insure desired service levels can be provided, that non-deferrable capital improvement projects are accomplished, and that long-term development programs are executed in a timely and effective manner?

5. Do forecasting techniques currently in use systematically recognize factors which can significantly impact financial decision making and budget formulation processes beyond the budget year?

6. Are current revenue and expenditure forecasts effective in supporting short and long-term planning goals or do planning goals get adjusted to fit the forecasts?

7. Are California municipalities required by law to present balanced budgets?

8. For those revenue forecasts which originate in departments other than the Finance Department, are procedures for generating the forecasts documented? If not, do the forecasts submitted included detailed explanations of how they were developed?

9. Are variances between budgeted revenues and actual revenues for each fiscal year analysed as a matter of routine revenue management procedure? If so, are explanations of the reasons causing actual variances documented and used as a basis for the next revenue forecasting cycle?

10. What procedures are used to monitor internal and external actions which could impact on future revenues?

11. How are delinquent revenue accounts managed? What criteria is used to "write off" delinquent revenue accounts receivable?

12. Other than during the budget formulation process, are revenue forecasts generated? If so, what is the nature of such requirements? (mandated and/or standard policy)

13. What external sources of information are used in developing revenue forecasts? What internal sources are used?

14. Are revenues grouped into broad categories for purposes of forecasting? If so, what are these categories and what revenue accounts are included in each category?

APPENDIX D

TEST RESULTS OF ECONOMETRIC EQUATIONS
GENERAL FUND REVENUE FORECAST
CITY OF MONTEREY, CALIFORNIA
FISCAL YEARS 1970-1980

$$AVP = -114.205 + 2.016(CPI) - 0.046(PI)$$

(3.518) (-1.425)

F ratio = 178.327
SEE = 6.57
R^2 = 0.9808
MAPE = 3.78

Fiscal Year	Actual AVP $(000,000)	Predicted AVP $(000,000)	Percent Error
1970-71	68.4080	69.4530	+ 1.53
1971-72	69.6740	71.7503	+ 2.98
1972-73	73.2290	75.7296	+ 3.41
1973-74	84.9250	82.6613	- 2.67
1974-75	93.6670	100.4369	+ 7.23
1975-76	130.9070	122.3973	- 6.50
1976-77	136.4230	135.4511	- 0.71
1977-78	150.7110	144.4491	- 4.15
1978-79	165.4430	160.7950	- 2.81
1979-80	176.9330	187.1971	+ 5.80

UUT = 1657.22 + 7.148(POP) + 0.131(PI)

(5.67) (5.65)

F ratio = 851.08
SEE = 11.3752
R^2 = 0.9959
MAPE = 2.14

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	236.8000	251.3254	+ 6.13
1971-72	328.2998	307.8694	- 6.22
1972-73	345.2000	339.8081	- 1.56
1973-74	383.2000	394.7605	+ 3.02
1974-75	447.2000	441.5249	- 1.27
1975-76	485.2998	492.4368	+ 1.47
1976-77	531.5999	534.0774	+ 0.47
1977-78	606.7000	602.6069	- 0.67
1978-79	666.0999	664.0774	- 0.30
1979-80	718.8999	720.8342	+ 0.27

STAX = 200.044 + 0.402(PI) + 0.979(TAXS)

(0.740) (0.937)

F ratio = 133.290
SEE = 100.7078
R^2 = 0.9744
MAPE = 3.45

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	996.7000	1028.4656	+ 3.19
1971-72	1125.3999	1130.6372	+ 0.46
1972-73	1347.3999	1261.7229	- 6.36
1973-74	1424.7000	1405.3208	- 1.36
1974-75	1624.5000	1579.2739	- 2.78
1975-76	1699.7998	1722.6560	+ 1.34
1976-77	1757.2998	1844.7644	+ 4.98
1977-78	2132.8999	2167.3481	+ 1.62
1978-79	2302.3999	2445.3101	+ 6.21
1979-80	2793.0000	2618.6042	- 6.24

FRAN = - 136.114 + 2.611(CPI) - 0.078(PI)

(5.666) (-2.995)

F ratio = 294.763
SEE = 5.2840
R^2 = 0.9883
MAPE = 3.03

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	75.5000	82.1124	+ 8.76
1971-72	82.8000	82.5703	- 0.28
1972-73	85.4000	85.9517	+ 0.65
1973-74	98.5000	91.9340	- 6.67
1974-75	110.4000	111.7073	+ 1.18
1975-76	141.7000	137.1211	- 3.23
1976-77	149.6000	152.0981	+ 1.67
1977-78	163.6000	157.7497	- 3.58
1978-79	164.5000	171.2034	+ 4.08
1979-80	202.9000	202.4524	- 0.22

$$BL = 38.329 + 0.007(CPI) + 0.139(POP) + 0.174(TAXS)$$

$$\qquad\qquad (0.018) \qquad (0.159) \qquad (3.763)$$

F ratio = 287.269
SEE = 3.7691
R^2 = 0.9954
MAPE = 2.20

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	144.5000	144.0903	- 0.28
1971-72	153.7000	153.2247	- 0.31
1972-73	170.7000	170.0272	- 0.39
1973-74	184.2000	184.5861	+ 0.21
1974-75	203.1000	203.3953	+ 0.15
1975-76	212.0000	217.7494	+ 2.71
1976-77	237.3000	232.5402	- 2.01
1977-78	267.2000	267.0874	- 0.04
1978-79	530.7000	573.4072	+ 8.05 *
1979-80	665.7996	613.6604	- 7.83 *

* Since tax rate doubled in 1978-79 and tax base remained constant, revise equation by multiplying it by two. Thus, new equation from 1978-79 on is:

$$BL = 2\ [38.329 + 0.007\ (CPI) + 0.139(POP) + 0.174(TAXS)]$$

$$LICPER = 26.906 + 0.001\ (CPI)^2$$

$$(6.929)$$

F ratio = 48.012
SEE = 6.5166
R^2 = 0.8572
MAPE = 9.06

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	40.2000	44.9883	+ 11.91
1971-72	48.4000	46.3561	- 4.22
1972-73	53.6000	47.7403	- 10.93
1973-74	42.8000	50.2238	+ 17.35 *
1974-75	58.3000	55.0230	- 5.62
1975-76	70.8000	61.0389	- 13.79
1976-77	60.2000	64.9645	+ 7.91
1977-78	69.2000	70.5955	+ 2.02
1978-79	71.7000	79.6635	+ 11.11
1979-80	94.4000	89.0058	- 5.71

* Specific cause of extreme fluctuation could not be isolated.

ROA = - 2077.089 + 10.370(POP)

(12.13)

F ratio = 147.15
SEE = 28.3809
R^2 = 0.9484
MAPE = 3.53

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	511.0000	488.4890	- 4.41
1971-72	513.7998	544.4871	+ 5.97
1972-73	535.2998	572.4863	+ 6.95
1973-74	652.0999	621.2249	- 4.73
1974-75	690.0000	655.4465	- 5.01
1975-76	699.2998	697.9622	- 0.19
1976-77	706.2998	738.4067	+ 4.55
1977-78	776.0999	775.7373	- 0.05
1978-79	804.0000	785.0718	- 2.35
1979-80	828.2998	836.9219	+ 1.04

CURSER = - 4036.978 + 17.172(POP) - 0.120(PI)

(4.50) (-1.72)

F ratio = 56.184
SEE = 34.4796
R^2 = 0.9414
MAPE = 12.66

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	119.0000	82.1914	- 30.93 *
1971-72	101.6000	158.3984	+ 55.90 *
1972-73	178.1000	193.1211	+ 8.43
1973-74	248.2000	254.1602	+ 2.40
1974-75	339.0999	289.4844	- 14.63
1975-76	345.7000	339.9883	- 1.65
1976-77	406.2000	394.2852	- 2.93
1977-78	388.5999	416.6914	+ 7.23
1978-79	377.2000	381.4648	+ 1.13
1979-80	454.0000	447.9688	- 1.33

* Cause of extreme fluctuation is due to one-time consultant fees associated with Environmental Impact Reports.

$$TOT = 6066.570 - 32.164(POP) + 1.298(PI) + 160.596(TOTR)$$
$$\qquad\qquad\quad (-1.797) \qquad (2.8888) \qquad (1.310)$$

F ratio = 56.316
SEE = 140.2050
R^2 = 0.9657
MAPE = 8.80

Fiscal Year	Actual Revenue $(000)	Predicted Revenue $(000)	Percent Error
1970-71	336.0	304.3	- 9.4
1971-72	374.0	308.8	- 17.4 *
1972-73	501.0	508.1	+ 1.4
1973-74	553.2	569.1	+ 2.9
1974-75	620.0	693.1	+ 11.8
1975-76	747.0	775.8	+ 3.9
1976-77	872.9	787.1	- 9.8
1977-78	990.0	1096.3	+ 10.7
1978-79	1751.5	1935.1	+ 10.5
1979-80	2215.1	1983.0	- 10.5

* Cause of extreme fluctuation is due to a significant increase in the tax base.

12 Tuesday, Nov. 25, 1980. Monterey Peninsula Herald.

1981 Economy Forecast For Monterey County

Monterey County is expected to match the expected overall growth of the California economy in 1981, according to a forecast by United California Bank.

Commenting on the bank's 18th annual economic forecast for the state, P. Kenneth Ackbarali, UCB vice president and monetary economist, said today in Monterey:

"Per capita income in Monterey County is predicted to increase by 11.5 percent in 1981, just above the expected growth of 11 percent for the state as a whole."

Meanwhile, he said, total personal income in the county is expected to exceed $3.6 billion in 1981, for a growth rate of 12.9 percent, the same percentage forecast for the entire state. An 11 percent rise in the median family income to $26,300, or about the same as the statewide average, is also expected.

The county's four main industries—agriculture, retail trade, tourism and government—are expected to generate a total of 1,000 new jobs in 1981 to make up for the same number of jobs lost this year, he said.

He cited depressed housing and automobile industries as largely responsible for declining employment levels this year.

Retail trade, he said, is expected to turn in a good performance next year to produce total sales of $1.6 billion, for a 12.6 percent growth rate, just shy of the projection for the state as a whole.

He said the expected rise in retail sales is based on the assumption that the county's natural environment and variety of shopping areas will continue to attract large numbers of visitors.

About homebuilding in the county, Ackbarali said a strong rebound is projected following this year's 37 percent cut in housing starts.

"An estimated 1,700 new homes will be built in 1981, an increase of 500 from the previous year's level, or a 42 percent increase, compared with 28 percent for the state as a whole," he said.

However, he noted:

"Many potential homebuyers are likely to be eliminated from the market by high mortgage interest rates."

Although interest rates are expected to fall below 13 percent in early 1981, he said, a rise to nearly 16 percent is projected for later that year.

"In addition, the median home price has risen to well over $100,000 and is expected to increase by another 12 percent to 15 percent in 1981—making it difficult for the first-time homebuyer to quallfy for financing," he said.

The one area where the county is expected to lag behind the state next year is in population growth. UCB forecasts an additional population in the county of 3,000, or slightly more than 1 percent, compared with a projected state population growth of 1.7 percent.

The county's current population is 273,532, according to preliminary census figures, or 281,285, according to state and local estimates.

APPENDIX F

GENERAL FUND REVENUE FORECAST FOR THE ECONOMETRIC MODEL
CITY OF MONTEREY, CALIFORNIA
FISCAL YEARS 1980-1985

$$AVP = -114.205 + 2.016(CPI) - 0.046(PI)$$
$$(3.518) \qquad (-1.425)$$

F ratio = 178.327
SEE = 6.57
R^2 = 0.9808
MAPE = 3.78

AVP FORECAST

Fiscal Year	CPI	PI $(000,000)	Predicted AVP $(000)
1980-81	247.3	3188.7	237,672
1981-82	275.0	3600.0	274,595
1982-83	300.6	4032.0	306,333
1983-84	321.6	4515.8	326,414
1984-85	344.1	5057.7	346,846

PROPERTY TAX FORECAST

Property Tax Revenue = AVP x County Tax Rate x City Portion

Fiscal Year	AVP $(000)	County Tax Rate	City Portion	Projected Property Tax $(000)
1980-81	237,672	0.04	0.17	1616.2
1981-82	274,595	0.04	0.17	1865.1
1982-83	306,333	0.04	0.17	2131.0
1983-84	326,414	0.04	0.17	2219.6
1984-85	346,846	0.04	0.17	2358.6

$$UUT = -1657.22 + 7.148(POP) + 0.131(PI)$$
$$\qquad\qquad\qquad\quad (5.67) \qquad\quad (5.65)$$

F ratio = 851.08
SEE = 11.37
R^2 = 0.9959
MAPE = 2.14

Fiscal Year	POP (000)	PI $(000,000)	Predicted UUT $(000)
1980-81	290.0	3188.7	833.42
1981-82	294.0	3600.0	915.89
1982-83	298.0	4032.0	1001.08
1983-84	301.0	4515.8	1085.90
1984-85	307.0	5057.7	1199.77

$$STAX = 200.044 + 0.402(PI) + 0.979(TAXS)$$
$$\qquad\qquad\qquad\quad (0.740) \qquad (0.937)$$

F ratio = 133.290
SEE = 100.7078
R^2 = 0.9744
MAPE = 3.45

Fiscal Year	PI $(000,000)	Taxs $(000,000)	Predicted STAX $(000)
1980-81	3188.7	1421.0	2873.1
1981-82	3600.0	1600.0	3213.6
1982-83	4032.0	1792.0	3575.3
1983-84	4515.8	2007.0	3980.2
1984-85	5057.7	2247.9	4433.9

$$FRAN = -136.114 + 2.611(CPI) - 0.078(PI)$$
$$\qquad\qquad\qquad\quad (5.666) \qquad (-2.995)$$

F ratio = 294.763
SEE = 5.2840
R^2 = 0.9883
MAPE = 3.03

Fiscal Year	CPI	PI $(000,000)	Predicted FRAN $(000)
1980-81	247.3	3188.7	260.9
1981-82	275.0	3600.0	301.0
1982-83	300.6	4032.0	334.3
1983-84	321.6	4515.8	351.4
1984-85	344.1	5057.7	367.8

$$BL = 2\left[38.329 + 0.007(CPI) + 0.139(POP) + 0.174(TAXS)\right]$$
$$\qquad\qquad\qquad\quad (0.018) \qquad (0.159) \qquad (3.763)$$

F ratio = 287.269
SEE = 3.7691
R^2 = 0.9954
MAPE = 2.20

Fiscal Year	CPI	POP (000)	TAXS $(000,000)	Predicted BL $(000)
1980-81	247.3	290.0	1421.0	655.2
1981-82	275.0	294.0	1600.0	719.0
1982-83	300.6	298.0	1792.0	787.3
1983-84	321.6	301.0	2007.0	863.3
1984-85	344.1	307.0	2247.9	949.1

$$LICPER = 26.906 + 0.001(CPI)^2$$

(6.929)

F ratio = 48.012
SEE = 6.5166
R^2 = 0.8572
MAPE = 9.06

Fiscal Year	CPI	Predicted LICPER $(000)
1980-81	247.3	88.1
1981-82	275.0	102.5
1982-83	300.6	117.3
1983-84	321.6	130.3
1984-85	344.1	145.3

$$ROA = -2077.089 + 10.370(POP)$$

(12.13)

F ratio = 147.15
SEE = 28.3809
R^2 = 0.9484
MAPE = 3.53

Fiscal Year	POP (000)	Predicted ROA $(000)
1980-81	290.0	930.2
1981-82	294.0	971.7
1982-83	298.0	1013.2
1983-84	301.0	1044.3
1984-85	307.0	1106.5

CURSER = -4036.978 + 17.172(POP) - 0.120(PI)

(4.50) (-1.72)

F ratio = 56.19
SEE = 34.48
R^2 = 0.9414
MAPE = 12.66

Fiscal Year	POP (000)	PI $(000,000)	Predicted CURSER $(000)
1980-81	290.0	3188.7	560.3
1981-82	294.0	3600.0-	579.6
1982-83	298.0	4032.0	596.4
1983-84	301.0	4515.8	589.9
1984-85	307.0	5057.7	627.9

TOT = 6066.570 - 32.164(POP) + 1.298(PI) + 160.596(TOTR)

(-1.797) (2.888) (1.310)

F ratio = 56.316
SEE = 140.2050
R^2 = 0.9657
MAPE = 8.80

Fiscal Year	POP (000)	PI $(000,000)	TOTR (%)	Predicted TOT $(000)
1980-81	290.0	3188.7	8.0	2162.7
1981-82	294.0	3600.0	8.0	2567.9
1982-83	298.0	4032.0	8.0	3000.0
1983-84	301.0	4515.8	8.0	3531.5
1984-85	307.0	5057.7	8.0	4041.9

(TOT transferred to General Fund on next page)

TOT Transfer = TOT-0.10(TOT)*-SPECIAL FUND 43.01 Expenditures

Fiscal Year	TOT $(000)	0.10(TOT)	Fund 43.01 Expenditure $(000)	Projected TOT Transfer $(000)
1980-81	2162.7	216.3	495.0	1451.4
1981-82	2567.9	256.8	495.0	1816.1
1982-83	3000.0	300.0	495.0	2205.0
1983-84	3531.5	353.2	495.0	2683.3
1984-85	4041.9	404.2	495.0	3142.7

* Exempt from transfer-retained in Harbor Development Fund 43.02.

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